

the Montana

WEED MANAGEMENT PLAN



WEED SUMMIT STEERING COMMITTEE WEED MANAGEMENT TASK FORCE

IN COOPERATION WITH
MONTANA WEED CONTROL ASSOCIATION
FEDERAL AND STATE AGENCIES
MONTANA UNIVERSITY SYSTEM
COUNTY WEED DISTRICTS
PRIVATE LAND MANAGERS

OFFICE OF THE GOVERNOR
STATE OF MONTANA

BRIAN SCHWEITZER
GOVERNOR



JOHN BOWLINGER
LT. GOVERNOR

January 2005

Dear friends,

The Montana Weed Management Plan is the most comprehensive and well-defined state plan in the nation. This 2005 Plan update outlines current weed programs and weed management budgets for all responsible parties across Montana, highlights strengths of current programs and identifies needs for those programs.

The purpose of the Montana Weed Management Plan is to strengthen, support and coordinate private, county, state, and federal weed management efforts in the state, and to promote implementation of ecologically based integrated weed management programs.

Non-native species are altering ecosystems, reducing cropland and rangeland productivity, impacting wildlife habitat and threatening survival of native species. Please join me in supporting efforts to reduce weed populations and their spread in Montana. Management of noxious weeds is everyone's responsibility. This serious threat to our native landscapes and ecosystems will be stopped only if we work together.

Thank you for your support of the Montana Weed Management Plan.

Sincerely,

A handwritten signature in black ink, appearing to read "B. Schweitzer", with a long, sweeping horizontal line extending to the right.

BRIAN SCHWEITZER
Governor



Montana passed its first legislative measure to control undesirable weed species in 1895. Since the 1920's, noxious weeds have moved across the state and today infest every county totaling over 8 million acres. The amount of revenue currently needed to stop the spread and reduce noxious weed infestations by 5% a year in Montana is about \$47 million annually, more than double the present budget.

The Montana Noxious Weed Plan is a dynamic document that enables all the people of Montana to work together to resolve the noxious weed problem. The comprehensive plan includes five key components for managing weeds:

1. Risk analysis and prevention
2. Management
3. Inventory and Monitoring
4. Awareness and Education
5. Research

This Plan offers an opportunity for anyone interested in noxious weeds to make a contribution. Over the past 25 years, agricultural, natural resource, urban interests, and private and public landowners have found ways to work together on noxious weeds programs. This is the main reason Montana is leading the nation in addressing noxious weeds issues.

The Montana Noxious Weed Management Plan provides a coordinated strategy for us to continue to be effective in managing noxious weeds. It is up to us to implement this Plan!

A handwritten signature in black ink, appearing to read "Gerald W. Marks". The signature is fluid and cursive, with a large initial "G" and "M".

Gerald W. Marks, President
Montana Weed Control Association

MONTANA WEED MANAGEMENT PLAN

MONTANA SUMMIT STEERING COMMITTEE

WEED MANAGEMENT TASK FORCE



Cover drawing by Jennifer Cramer

In cooperation with:

MONTANA WEED CONTROL ASSOCIATION

FEDERAL AND STATE AGENCIES

MONTANA UNIVERSITY SYSTEM

COUNTY WEED DISTRICTS

PRIVATE LAND MANAGERS

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Northeast wetland flora: Field office guide to plant species.
Northeast National Technical Center, Chester, PA.

EXECUTIVE SUMMARY

Rangeland, pastureland, cropland, forests, and wildlands comprise 92 million acres, or 98% of the total land area in Montana. These lands are vital for agricultural production and protecting the integrity of ecological systems. Currently 27 noxious weeds infest about 8.2 million acres in Montana. These non-native species are affecting the economic stability of the state and impacting the ecological integrity of Montana's lands and waters.

The purpose of the Montana Weed Management Plan is to strengthen, support, and coordinate private, county, state, and federal weed management efforts in the state, and promote implementation of ecologically-based integrated weed management programs. There are 10 objectives identified within the plan. These objectives will: 1) provide guidelines for private, county, state, and federal land managers to develop goals and plans consistent with state and national strategies; 2) provide a method of prioritizing management strategies and allocating limited resources; and 3) prioritize Noxious Weed Trust Fund grants based on compatibility and compliance with the state plan.

Financial resources are currently inadequate to effectively manage noxious weeds in Montana. Increased funding to private land managers, county weed districts, federal, and state agencies, and improved efficiency and organization of grass-roots efforts are critical to implementing viable weed management programs in the state. It is calculated that approximately \$47 million (2.5 times the current budget) is needed to implement a balanced weed management program that slows weed spread and reduces current infestations by 5% per year.

LEADERSHIP

This Plan was designed and supported by weed managers in Montana including state, federal, county, and private stakeholders. It is a dynamic document that requires involvement of Montana citizens, and local, regional and national stakeholders to meet objectives and implement the Plan. The Weed Summit Steering Committee has responsibility for identifying and supporting leaders for action items identified within this Plan. These leaders will provide local and statewide direction and organization to promote and support weed management programs in Montana.

PLAN OF ACTION

The magnitude and complexity of the noxious weed problem in Montana requires a comprehensive plan of action with five major components. These components are: 1) risk analysis and prevention; 2) management; 3) inventory, monitoring, and evaluation; 4) public awareness, education and outreach; and 5) research.

RISK ANALYSIS AND PREVENTION: *Action: The Plan proposes to enhance prevention programs in the state by improving prediction models and identifying pathways for weed invasion; engaging and educating landowners to protect areas from introduction and spread of weeds; promoting ecosystem management concepts; regulating introduction and movement of weeds in Montana, and refining early detection/rapid response efforts on new invaders.*

MANAGEMENT: Management of noxious weeds in Montana is divided into three priorities based on a unique classification system. These include non-established new invaders (Category 3), established new invaders (Category 2), and those widespread in the state (Category 1).

NEW INVADERS. Category 2 and 3 weeds are the highest priority species for management in Montana.

The goal is preventing invasion, eradicating small infestations, or long-term, high-intensity containment of larger infestations to prevent movement to non-infested sites. *Action: A \$4.7-million annual budget is proposed for prevention, early detection and rapid response, and task force operations.*

WIDESPREAD WEED INFESTATIONS (Category 1). Reducing established noxious weed infestations and containing their spread by expanding Cooperative Weed Management Areas (CWMAs) would minimize economic and environmental impacts of weeds in Montana. *Action: The Plan proposes to support increased funding for weed management within county, state, and federal entities; facilitate partnerships between agencies and private land managers through CWMAs; and secure cost-share programs to assist private land managers. About \$24 million is needed annually to adequately address management of established noxious weeds in the state.*

INVENTORY, MONITORING, AND EVALUATION: This information is critical for identifying non-infested lands, detecting newly invading weeds, identifying boundaries of established weed infestations, developing management plans, and evaluating weed management efforts in the state. *Action: An estimated \$4.7 million annually is needed to complete plant and section-based inventories, increase private and agency participation in statewide inventory efforts, and facilitate web-based data entry and retrieval.*

PUBLIC AWARENESS, EDUCATION AND OUTREACH: The purpose of the public awareness, education, and outreach component of this Plan will ensure that everyone in Montana is aware of the serious impacts of noxious weeds on natural resources, and land managers implement systems-based integrated weed management (IWM) methods. *Action: An estimated \$3.4 million annually is needed to meet public awareness, education, and outreach components of the Montana Weed Plan.*

RESEARCH: Research provides a scientific foundation for sustainable, ecologically-based weed management. Six research areas are identified: Impacts, Prevention, Weed Biology and Plant Dynamics, Integrated Weed Management, Land Restoration, and Effects of Natural Disasters (fire, flood, drought, etc.). *Action: An estimated \$4.7 million is needed annually to conduct research required to fill information gaps and to transfer new technologies to Montana land managers.*

INDEX TO ABBREVIATIONS AND ACRONYMS

AA, Assistance Agreements	MDC, Department of Corrections
ANS, Aquatic Nuisance Species	MDT, Department of Transportation
APHIS, Animal and Plant Health Inspection Service	MOU, Memorandum of Understanding
ARS, USDA Agricultural Research Service	MRL, Montana Rail Link
BAER, Burned Area Emergency Rehabilitation	MSU, Montana State University
BIA, Bureau of Indian Affairs	MWCA, Montana Weed Control Association
BLM, USDI Bureau of Land Management	NAWMA, North American Weed Management Association
BN, Burlington Northern	NEPA, National Environmental Policy Act
BOR, Bureau of Reclamation	NFWF, National Fish and Wildlife Foundation
CABI, Commonwealth Agricultural Bureau International	NPS, USDI National Park Service
CES, Cooperative Extension Service	NRCS, USDA Natural Resource Conservation Service
CIPM, Center for Invasive Plant Management	NRCS, Natural Resource Conservation Service
CWMA, Cooperative Weed Management Area	NRIS, Natural Resources Information Service
DNRC, Department of Natural Resources and Conservation	NWTF, Noxious Weed Trust Fund
DPHHS, Department of Public Health and Human Services	PI, Private Industry
EIS, Environmental Impact Statement	RMEF, Rocky Mountain Elk Foundation
EPMT, Exotic Plant Management Team	SNWAEC, Statewide Noxious Weed Awareness and Education Campaign
EQIP, Environmental Quality Incentive Program	SWCD, Soil and Water Conservation District
FS, USDA Forest Service	TNC, The Nature Conservancy
FSA, Farm Service Agency	UM, University of Montana
FWP, Department of Fish, Wildlife, and Parks	UP, Union Pacific
FWS, USDI Fish and Wildlife Service	USDA, United States Department of Agriculture
GIS, Geographic Information System	USDI, United States Department of Interior
IWM, Integrated Weed Management	WMA, Weed Management Area
MACO, Montana Association of Counties	YNP, Yellowstone National Park
MDA, Montana Department of Agriculture	



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FORWARD

Noxious weeds pose a major threat to Montana's economy and environment. During the past century, weeds have infested over 8.2 million acres, or about 9% of the state, degrading the productivity and biological diversity of ecosystems. An action plan involving private, county, state, and federal entities is critical to stop introduction of new weed species and reduce the spread of established infestations.

Montana's Weed Management Plan is the result of goals and issues outlined in 1995 by the Vision 2020 working group, and further refined at the Governor's Montana Weed Summit held in October 1998. The mission of Vision 2020 was *to encourage all Montana citizens and land managers to support and implement long-term resource management plans and integrated noxious weed management strategies*. Critical issues and goals for four major areas of weed management were identified in Vision 2020 and the Governor's Summit. These management components comprise the action plan for the state: 1) Public Education and Awareness; 2) Research and Information Sharing; 3) Prevention; and 4) Weed Management.

In 2004, the Weed Summit Steering Committee and the Montana Weed Control Association recognized the need to revise and re-direct the plan to increase effectiveness of the statewide weed management effort. This revision reflects progress made in the plan during the past five years and strengthens existing goals and objectives. The Management Plan continues to provide the conceptual framework and recommendations for actions to prevent introduction and manage the spread of noxious weeds in Montana. The Plan provides guidance and direction on a statewide level while maintaining flexibility for local priorities and actions. It is designed to complement regional, national, and international strategies in the National Invasive Species Management Plan.

The Montana Weed Management Plan identifies current and future challenges posed by noxious weeds and describes how county, state, and federal programs and legislation can be improved to help solve the problem. This action plan has been designed and supported by weed managers in Montana including state, federal, county, and private stakeholders. It is a dynamic document that requires the support and involvement of all Montana citizens to meet objectives and implement and improve the plan over the long-term.

ORGANIZATION OF THE PLAN

This is not a detailed plan that describes management criteria for individual weed species. Rather it provides an outline of current programs and needs to more effectively meet short- and long-term management objectives. The plan is divided into five major chapters with supporting material in the Appendices.

Chapter 1 describes objectives of the management plan, briefly discusses problems and impacts associated with noxious weeds in Montana. This chapter also provides an overview of noxious weed species and categories, and summarizes current legislation that affects weed introduction, spread, and management activities in the state. A more in-depth discussion of legislation is in Appendix D.

Chapter 2 describes existing programs and capabilities of private, county, state, and federal land managers and agencies. Budget and program needs are discussed for each entity.

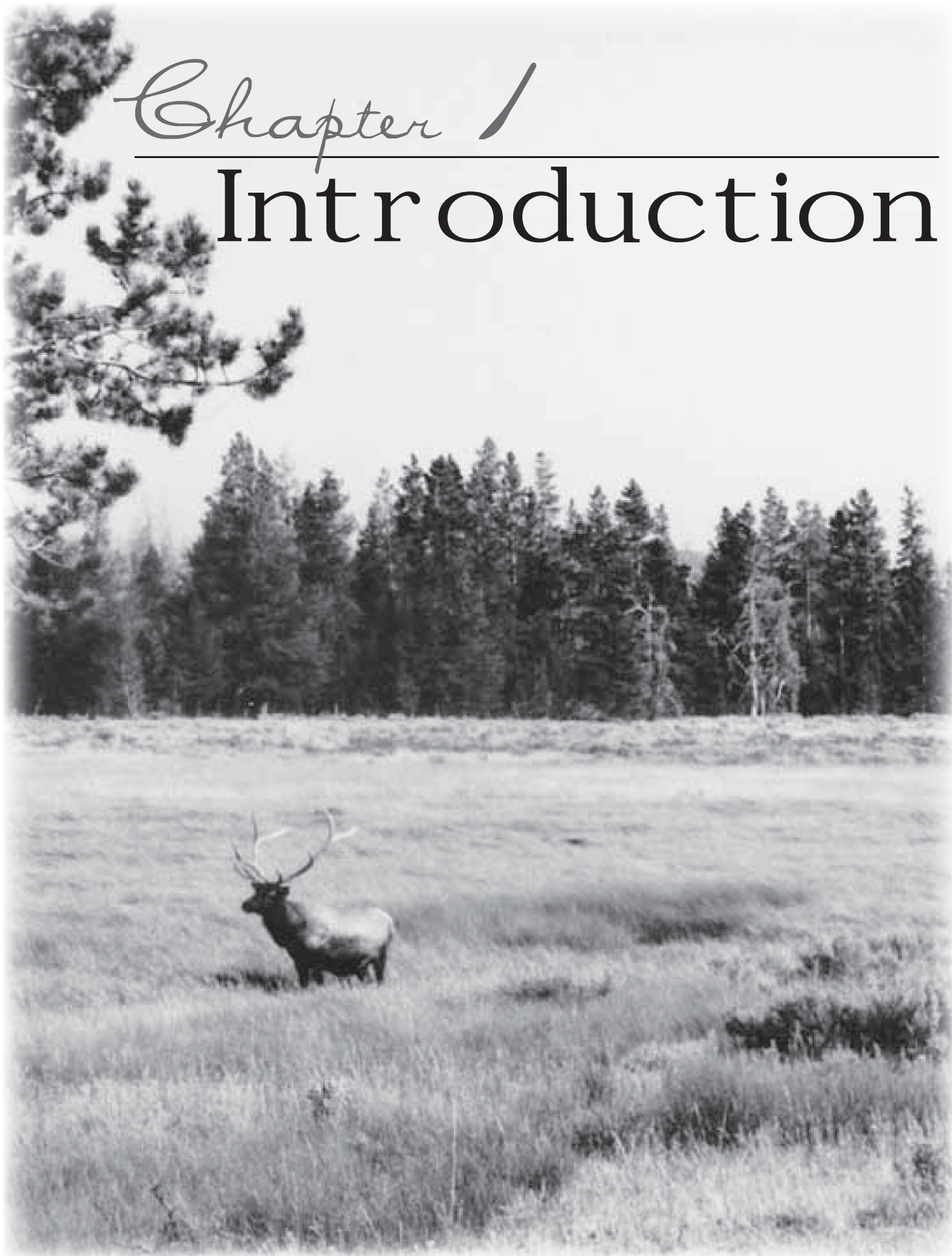
Chapter 3 is the Plan of Action section regarding statewide strategies to reduce the risk of weed introductions, management of new and existing infestations, inventory and monitoring, public awareness and education, and research priorities. Existing and proposed programs are described and budget needs addressed for each action item.

Chapter 4 is the budget outlining current funding and program needs to stop the spread and reduce infestation levels by 5% per year.

Chapter 5 describes duties, responsibilities, and dates for implementing Action Items identified within the Plan.

Chapter 1

Introduction



CHAPTER 1 - INTRODUCTION

The purpose of the Montana Weed Management Plan is *to strengthen, support, and coordinate private, county, state, and federal weed management efforts in Montana, and promote implementation of ecologically-based noxious weed management programs*. The magnitude and complexity of noxious weeds in Montana requires a comprehensive and thoughtful management plan that can achieve reasonable objectives. These objectives will: 1) provide guidelines for private, county, state, and federal land managers to develop goals and plans consistent with state and national strategies; 2) provide a method of prioritizing management strategies and allocating limited resources based upon prioritized objectives; and 3) prioritize Noxious Weed Trust Fund grants based on compatibility and compliance with the Plan. This plan is a dynamic document that will be evaluated and revised every two years. Specific objectives, issues, and programs are discussed to increase awareness and foster coordinated, cooperative weed management efforts statewide.

OBJECTIVES

- 1) Develop stable long-term funding sources for private, county, state, and federal land managers to implement a comprehensive weed management program that includes all aspects of integrated weed management.
- 2) Strengthen and expand Cooperative Weed Management Areas that include private, municipal, university, county, state, tribal, and federal land interests.
- 3) Establish strategies for managing weeds on a priority basis, including the development of memorandums of understanding (MOUs).

- 4) Strengthen compliance with the Montana County Weed Control Act and the Montana Weed Control Act.
- 5) Promote the development and maintenance of noxious weed inventories on all lands in Montana for inclusion in the statewide database system.
- 6) Prevent introduction and establishment of noxious weeds and aquatic nuisance plant species into non-infested land and water in Montana.
- 7) Raise awareness and understanding of effects and affects of noxious weeds on Montana's natural resources and citizens, educate local communities and individuals on integrated weed management methods, and prepare educators to empower local communities to implement these methods.
- 8) Promote and support noxious weed research based on needs determined by public and private land managers.



Noxious weeds such as oxeye daisy (above) impact Montana's economy and environment.

- 9) Implement ecologically-based, integrated weed management programs.
- 10) Prepare for weed-related emergencies that occur from fires, drought, flood, or other major natural or human-caused disturbances.

NOXIOUS WEED IMPACTS

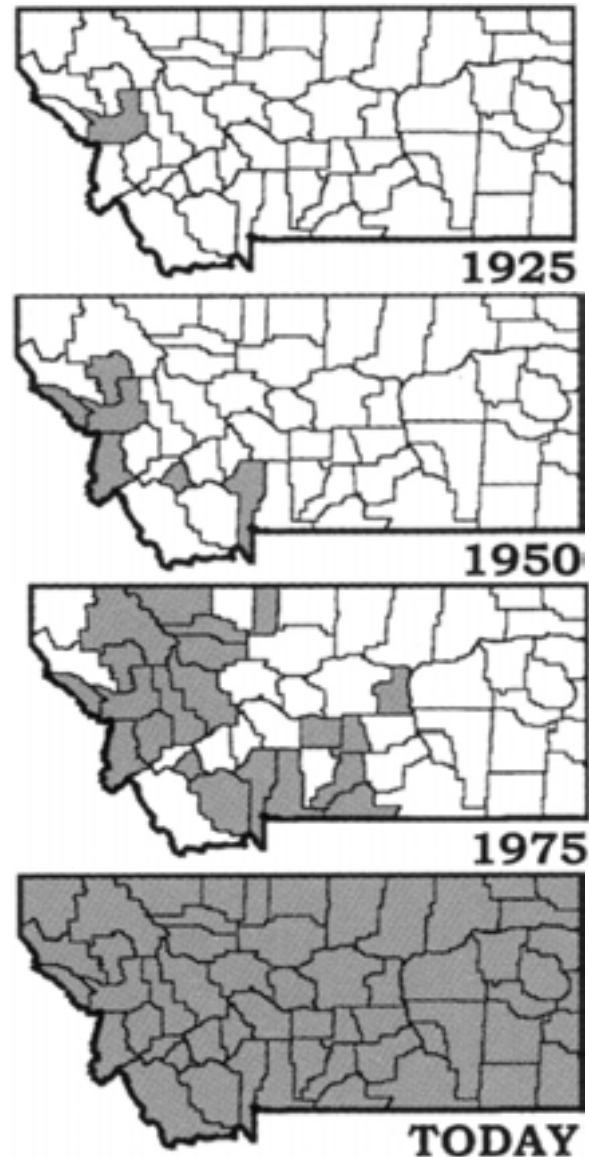
A weed is defined as any plant that interferes with management objectives for a given area of land (or body of water) at a given point in time. Once a plant has been classified as a weed, it attains a “noxious” status by Rule as described in the Montana County Weed Control Act. Noxious weeds are defined as “plants of foreign origin that can directly or indirectly injure agriculture, navigation, fish or wildlife, or public health”. Currently there are 27 weeds on the statewide noxious weed list that infest about 8.2 million acres in Montana. Although there are native and intentionally introduced non-native plants that have invasive characteristics, this plan will focus on state-listed noxious weeds.

Noxious weeds are reducing economic productivity and ecological integrity of Montana’s lands and waters. The rate of introduction and spread of noxious weeds has increased dramatically over the past 150 years with increases in human activities, trade, and commerce. For example, spotted knapweed was first recorded in the state in the early 1920’s. Since that time it has spread to infest about 3.8 million acres in the state. The introduction and spread of spotted knapweed is characteristic of several noxious weeds in Montana (Figure 1.1).

The ecological and economic impacts caused by noxious weeds in Montana are numerous; the following information describes some of these effects. Water quality and long-term production potential of land can be reduced when tap-rooted species such as spotted and diffuse knapweed invade grasslands. In western Montana, surface runoff was 56% higher and sediment yield was 192% higher on spotted knapweed infested sites compared to those

dominated by native bunchgrass (Lacey et al 1989).

Figure 1.1: Montana counties reporting infestations of spotted knapweed from 1920 to present (Invaders database).



Exotic species can also alter hydrologic cycles, sediment deposition, erosion, and other ecosystem processes causing serious ecological damage. Saltcedar, a relatively new invader in Montana, impacts wetland and riparian areas by

lowering water tables and changing soil properties. This reduces or eliminates surface water habitats required by native plants and animals. Saltcedar infestations also trap more sediment than stands of native vegetation, thus altering the shape, carrying capacity and flooding cycle of water courses (McDaniel et al. 2005).

The Montana Natural Heritage Program lists Sapphire rockcress (*Arabis fecunda*) as a “Plant Species of Concern” (April 2003) due to very limited and potentially declining populations. Survival of the plant is at risk in part because of encroachment by spotted knapweed, which reduces seedling establishment (Lesica 1991).

Noxious weeds are recognized as serious problems on lands managed for wilderness or wildland values by federal, state, and private entities in Montana. When weeds invade and expand into a wilderness environment, the “naturalness” of the area is degraded and scientific values of once biologically diverse landscapes are impaired. Examples include leafy spurge infestations at Pine Butte Swamp Preserve and the remote Danaher Creek area of the Bob Marshall Wilderness, and spotted knapweed invasions in most wilderness areas and National Parks.

The introduction of exotic plants influences wildlife by displacing forage species, modifying habitat structure—such as changing grassland to a forb-dominated community—or changing species interactions within the ecosystem. Leafy spurge reduced habitat utilization by bison (*Bos bison*), deer (*Odocoileus* spp.), and elk (*Cervus elaphus*) (Trammell and Butler 1995) in western North Dakota. Spotted knapweed was shown to influence elk and deer foraging behavior and population distribution in western Montana. Elk use increased an average of 266% after knapweed was removed from a winter range site (Thompson 1996). Although knapweed is common on most winter ranges in western Montana, studies indicate that the plant is not a major component of mule deer diet.

Noxious weeds also impact small birds and mammals. Grasshopper sparrow (*Ammodramus saviarum*) and savannah sparrow (*Passerculus sandwichensis*) densities were lower on high (>60%) leafy spurge cover than on medium (20 to 60%) or low (0 to 20%) cover (Scheiman et al. 2003). Purple loosestrife, a weed that infests wetlands, was first reported in Montana in 1980 and by 2004 infested 10 counties in the state. The weed forms dense infestations that reduce desirable plants, such as cattails, that are preferred habitats for muskrats and long-billed marsh wrens. Waterfowl broods are also more susceptible to predation because dense stands of purple loosestrife reduce access from water to nesting sites (Brown 2005). Changes in bird species have been reported on sites dominated by non-native weed species such as leafy spurge. Russian knapweed has been shown to reduce small mammal populations (mice) by altering species diversity (Kurz 1995).

Economic losses caused by leafy spurge and spotted knapweed have been calculated for Montana. The cost of leafy spurge to grazing lands and wildlands in the upper Great Plains including the states of Montana, North and South Dakota, and Wyoming is estimated at \$129.5 million annually and represents a potential loss of 1,433 jobs (Leitch et al. 1994). Knapweeds in Montana cost an estimated \$42 million annually, money that could support 518 full time jobs in the state. If spotted knapweed invaded 34 million vulnerable acres in Montana, loss to the livestock industry alone is estimated at \$155 million (Hirsch and Leitch 1996).

Although significant progress was made in weed management since 2000 (D. Burch personal communication), inadequate financial and manpower resources are available to effectively manage noxious weeds in Montana. Increased funding to private land managers, county weed districts, federal, and state agencies, and improving efficiency and organization of grass-roots efforts are needed to move Montana forward in effective weed management.

WEED LISTS AND CATEGORIES

The 27 noxious weeds in Montana are divided into three categories based on number of acres infested in the state and management criteria. This unique classification system is modified and updated as needed by the Statewide Noxious Weed List Advisory Committee, and determined by Rule of the Montana Department of Agriculture (MDA) under the provisions of the Montana County Weed Control Act. The Committee uses established criteria (Appendix A) to review requests for additions to the list. Recommendations from the Committee are made to the Director of the MDA. Weeds on federal and regional weed lists are reviewed for inclusion on the Montana state list based on their potential to invade and spread within the state. The 27 weeds on the statewide noxious weed list and the federal noxious weed list are found in Appendix B.



CATEGORY 1: WIDESPREAD NOXIOUS WEEDS

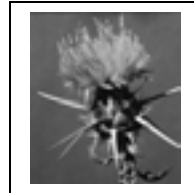
This category includes 14 generally widespread noxious weeds infesting about 8.1 million acres in the state (Appendix C). These weeds, such as spotted knapweed and leafy spurge, are capable of rapid spread and limit desirable land uses. Management criteria include public awareness and education, containment and suppression of existing infestations and prevention of new infestations.



CATEGORY 2 ESTABLISHED NEW INVADERS

This category includes eight noxious weed species infesting about 101,000 acres in

the state (Appendix C). These weeds have recently been introduced into Montana and/or are rapidly spreading from current infestations. Management criteria include awareness and education, prevention of movement into non-infested areas, monitoring and containment of known infestations, and eradication where possible.



CATEGORY 3 NON- ESTABLISHED NEW INVADERS

There are five noxious weeds within this category including yellow starthistle, common crupina, rush skeletonweed, Eurasian watermilfoil, and yellow flag iris. These weeds have either not been detected in the state or may be found in small, scattered, localized infestations. As of 2004, there were 200 acres of rush skeletonweed and 600 acres of yellow flag iris reported in Montana (Appendix C). Management criteria include public awareness and education, prevention of introduction and movement into non-infested areas, early detection, and immediate action to eradicate infestations.

MONTANA WEED LAWS AND REGULATIONS

The first noxious weed legislation in Montana was passed in 1939. Since that time additional laws and rules have been enacted to strengthen weed management efforts. The eight laws currently affecting weed management in Montana are summarized below and described in detail in Appendix D.

The statewide noxious weed list is updated as needed and is determined by Rule of the Montana Department of Agriculture (MDA) under the provisions of the Montana County Weed Control Act. Changes or additions are based on advice and recommendations from the Statewide Noxious Weed List Advisory Committee. The Committee reviews requests for additions to the list received by the MDA, using established criteria, and makes recommendations

to the Director of the MDA. Weeds on federal and regional weed lists are reviewed for inclusion on the statewide list based on their potential to invade and spread within Montana.

- 1) Montana County Weed Control Act (Title 7, Chapter 22 Part 21) provides for weed management activities at the county level. Local county government has the responsibility for the implementation and enforcement of weed management in Montana. County funding is limited to 2 mills with a yearly local levy allowing counties to fund above the two-mill cap. Yearly budgets range from \$13,000 to \$500,000 among counties, including grants and contracts. Total weed district budgets in FY2005 were \$3.9 million from county-tax revenue, and \$3.8 million from contract weed management (private, state, and federal contracts).
- 2) Montana Weed Control Act (Title 80, Chapter 7 Part 7) provides for technical assistance, embargoes, and rearing and distribution of biological weed control agents (80-7-720 MCA). Pursuant to 80-7-712 MCA, MDA can obtain federal funds and disburse these funds to local governments authorized to conduct noxious plant management programs.
- 3) Montana Noxious Weed Trust Fund Act is a grant-funding program designed to encourage and support local cooperative weed management programs, weed research, and public education, awareness, and outreach programs.

Revenue for the current grants program comes from interest from a permanent Trust, vehicle weed fee, and state and federal funding. Amount of grant revenue awarded in FY 04 was \$2,543,659 including \$390,600 county and reservation grants. Details regarding these funds are described in Appendix D.

- 4) Montana Noxious Weed Seed Free Forage Act establishes a certification program that provides for production of weed-seed-free forage and mulch used by individuals, agencies, and private corporations on public and private lands. The Montana program supports and complements the regional North American Weed Management Association (NAWMA) weed free forage certification program.
- 5) Montana Agricultural Seed Act lists prohibited and restricted weed seed levels that must be maintained in state certified seed.
- 6) Montana Commercial Feed Act prohibits noxious weeds in commercial feed.
- 7) Montana Environmental Policy Act must be addressed by state actions that have potential environmental or socioeconomic impacts.
- 8) Montana Nursery Law allows for inspection, certification, and embargo of all nursery stock for listed pests, including weeds.

Chapter 2

Existing Situation, Current Program, and Program Needs



CHAPTER 2 - EXISTING SITUATION, CURRENT PROGRAM, AND PROGRAM NEEDS

Montana encompasses about 94 million acres consisting of about 28% federal, 6% state, 3% tribal, and 63% private land ownership. Rangeland, pastureland, cropland, forests, national parks, nature preserves and other wildlands comprise about 92 million acres or 98% of the total land area of the state.¹ These lands are vital for agricultural production and protecting the integrity of ecological systems. Montana's weed program is divided into five cooperative working groups: 1) County Weed Districts implement and enforce the Montana County Weed Control Act and coordinate weed management activities within the county; 2) private land managers work cooperatively with county weed districts and other agencies to manage weeds on private lands; 3) state land management agencies develop long-term management plans and allocate funding within each county where they manage lands; 4) federal land managers work cooperatively with weed districts and adjoining landowners directly through management efforts and providing weed research and demonstration areas as an important part of the state program; 5) universities provide research, demonstration, and public education programs on noxious weeds. In addition to the five cooperative groups, special Task Forces have been developed on several new weed invaders; biological weed control; statewide education, awareness, and outreach; and the Montana weed mapping project. Considerable progress has been made toward implementing the Montana Weed Management Plan since 2000. Although some of the progress is described in this chapter, more detailed information is on file with Montana Department of Agriculture and

described in the Montana Weed Control Association Annual Conference Proceedings (2003).

Agencies, county weed districts, and private land managers and corporations provided information included in this section. However, some agencies did not report infested acreage or calculate budget requirements necessary to manage infestations. Estimated budget needs for agencies that did not submit information were based on weed acres as a percent of total infested lands in the state. For example, if an agency managed 1 million acres, then it was assumed that 9% or 90,000 acres were infested. These estimates were also used to calculate infested acres on privately owned lands. Cost of weed management was based on \$25.00² per acre for on-ground control, which represents a **MINIMUM** cost for weed management on rangeland and wildland sites in Montana. In many cases the \$25.00 per acre figure does not include labor and equipment costs, which may exceed \$400.00 per acre for remote backcountry infestations (McClure, personal communication).

COOPERATIVE WEED MANAGEMENT AREAS

Cooperative Weed Management Areas (CWMAs) are the foundation for effective weed management involving private and public lands in Montana. Since 1985, cost-share programs have provided incentive for development and implementation of CWMAs in Montana. Various grant funding mechanisms to support CWMAs are described below.

¹ [USDA NRCS] USDA Natural Resource Conservation Service. 1997. National Res. Inventory Summary Report 1997 (Updated 2000). [Online] http://www.nrcs.usda.gov/technical/NRI/1997/summary_report/table1.html. Accessed: April 2004.

² Based on Noxious Weed Trust Fund grant records for herbicide application.



Cooperative Weed Management Areas (CWMAs) are the foundation for effective weed management involving private and public lands in Montana. *Sula Peak Ranch - Sula, MT.*

NOXIOUS WEED TRUST FUND (NWTF)

The NWTF program was established in 1985 and is administered through the Montana Department of Agriculture. A large portion of grant funds is used to provide financial support for private and public land managers to work cooperatively on noxious weed management projects. Since its inception, the NWTF has awarded 899 local cooperative grants for a total of about \$16.9 million. Weed management programs funded must focus on state-listed noxious weeds and lands within projects must be part of an active CWMA. In 2004, active CWMA grants (FY 2003 and 2004) encompassed 18.8 million acres under integrated weed management programs. This includes protection of non-infested areas and treatment of 216,552 acres of noxious weeds, primarily on private lands. Weed control costs average about \$25.00 per acre depending on the weed treated and application method. The NWTF expenditures to support CWMAs averaged \$800,000 annually from 1985 through 2000, and about \$1.9 million annually from 2001 through 2004. Landowners within CWMAs provide a minimum of 50% matching funds. Funding sources for the Noxious Weed Trust Fund and other project funded are described under the

section on Montana Weed Laws and Regulations.

ROCKY MOUNTAIN ELK FOUNDATION (RMEF)

The mission of the Rocky Mountain Elk Foundation is to ensure the future of elk, other wildlife and their habitat. In support of this mission, the RMEF is committed to managing noxious weeds to conserve, restore, and enhance natural habitats. From 2000 through 2004, the RMEF allocated about \$385,312 to 50 cooperative vegetations management projects involving public and/or private lands. These projects utilized integrated weed management including burning, reseeding, fencing, livestock manipulation, release of biological agents, and use of herbicides.

NATIONAL FISH AND WILDLIFE FOUNDATION (NFWF)

The NFWF was established by Congress in 1984, and is a private, non-profit, organization dedicated to the conservation of fish, wildlife, and plants, and the habitat on which they depend. The NFWF in partnership with other federal agencies provides funding to non-profit organizations and government agencies interested in managing invasive and noxious plant species. Since 1997, the program has provided about \$670,260 in grants to 24 CWMAs in the state. From 2000 to 2004, total grants received in Montana from the NFWF for CWMAs were \$485,010 with \$1,205,074 in matching funds.

CENTER FOR INVASIVE PLANT MANAGEMENT (CIPM)

The CIPM provides grant funds to weed management areas in Montana in addition to funding weed research and public education programs. From 2000 to 2004, CIPM provided \$260,000 toward CWMAs and weed prevention projects in the state.

Program Needs

- 1) Identify and develop additional sources of funds to promote development and implementation of CWMA's in Montana.

COUNTY WEED DISTRICT PROGRAMS

The 56 County Weed Districts in Montana are the cornerstone of Montana's weed program. Weed districts implement and enforce the Montana County Weed Control Act in addition to conducting weed education and awareness programs, developing cooperative agreements and CWMA's, management of noxious weeds on county-owned/controlled lands and rights-of-way, coordinating weed management activities within and among counties, and monitoring weed infestations on private and public lands.

The county weed control district is responsible for developing a district-wide noxious weed management plan to assist county residents in complying with the Montana County Noxious Weed Law. The plan establishes management criteria for noxious weeds and describes weed district responsibility for management of noxious weeds on all land and rights-of-way owned or controlled by the county or municipalities within the district. Management criteria will include integration of cultural, chemical and biological methods for controlling noxious weeds.

Budget information from county weed districts in Montana indicate about \$3.9 million is generated annually from mill levies, general fund, or other county-tax revenue. This revenue is inadequate to support a minimum part-time position in 57% of counties. There were 13 counties capable of supporting a full-time position based on county-tax revenue alone. In an effort to support part- or full-time weed management positions, counties rely on revenue generated from contract weed control work. Contract revenue provides an additional \$3.9 million per year, primarily from Montana

Department of Transportation Maintenance Division and federal agencies, with limited income from private and state sources. About 84% of counties reported an increase in funding since 2000, with four counties reporting stable and five counties reporting decreased funding from 2000 to 2004. Funding levels in most counties were inconsistent and inadequate to meet current needs.

Program Needs

- 1) Develop long-term, stable, adequate funding for County Weed Districts.
- 2) Support employment of full-time coordinators to manage noxious weed programs in all counties, or consolidate multiple counties to insure a full-time position.
- 3) Update and expand county weed management plans biannually to complement Montana's State Weed Management Plan.
- 4) Coordinate weed inventories with the statewide program and integrate inventory and monitoring efforts into annual operations.
- 5) Build and/or expand partnerships with federal, state, city, tribal, and private entities.
- 6) Pursue federal, state, and other granting opportunities.
- 7) Develop cost-share incentives to assist land managers with noxious weed control.
- 8) Implement an education program at the county level that empowers individuals to implement integrated weed management strategies.

- 9) Include weed coordinator or weed board members on the subdivision committee of the County Planning Board.

PRIVATE LAND OWNERS

Private lands encompass approximately 59 million acres in Montana. The land is utilized as cropland (18.3 million acres), grazeable woodland (1.7 million acres), pasture and rangeland (38.2 million acres), and building lots, roads, and wasteland (0.8 million acres)¹. Weed inventory information is not available for all private lands in Montana. Based on about 6% of cropland and 9.5% of range, pasture, and grazeable woodland infested with noxious weeds, about 5 million acres of privately owned lands are infested in the state. This accounts for about 61% of the total weed acres reported in Montana. The Montana County Weed Control Act states that private land managers must develop and follow a weed management plan on their land. However, the magnitude of the weed problem, jurisdictional conflicts, cost of weed management, relatively low net return per acre of range and pastureland, and lack of cost-share funds has made it difficult for private landowners to effectively manage weeds. Although several counties offer cost-share programs for specific weed species, there are inadequate financial resources to assist private landowners with weed management. The NWTf and other grant programs through federal agencies, private foundations, and sportsman organizations provide limited funding for weed control on private lands. Cooperative Extension Service and County Weed Districts coordinate local public education programs and provides technical assistance and training to private land managers on noxious weed management issues. The Natural Resource Conservation Service (NRCS), Farm Service Agency (FSA), and Soil and Water Conservation Districts provide technical and some internal program-based financial assistance to landowners.

¹ Source: 2002 Census of Agriculture – Montana data.



Private lands encompass approximately 59 million acres in Montana. Eleven land trusts operating in Montana hold 1,500 conservation easements on 1,346,163 private acres in the state.

Weed management costs incurred by private land managers are difficult to assess. Based on estimates of herbicide sales and grants to CWMAs, about 196,000 acres of privately owned range, pasture, and grazable woodland are treated annually for noxious weeds at a cost of about \$4.9 million (includes grant and private dollars). Biological control agents are also released on leafy spurge and knapweed infestations, and livestock are utilized as a weed management tool, thus total acres managed are greater than 196,000.

The current level of management is not adequate to contain and manage noxious weed infestations in the state. At a spread rate of 10% per year, about 500,000 acres of private land (390,000 acres of range, pasture, and woodland) should be managed annually for noxious weeds to remain at current levels of infestations. This would require a budget about twice the present level of funding for on-ground management on range and pasturelands alone.

Program Needs

- 1) Identify and secure funding sources to support cost-share programs on private lands.
- 2) Work with Congress and land management agencies at state and

national level to implement federal cost-share.

- 3) Increase county weed budgets and dedicate a portion of those funds toward cost-share programs.
- 4) Increase funding to the NWTF to allow for additional grants to private lands.
- 5) Provide a leadership role in introducing weed education and prevention to community groups.

PRIVATE CONSERVATION ORGANIZATIONS

The Nature Conservancy (TNC) is one of the largest conservation organizations in Montana. In addition to protecting lands through conservation easements, the Conservancy owns and manages 77,480 acres within nine preserves in Montana. Their largest holding is the Matador Ranch in southern Phillips County. Management of invasive non-native plants is a priority on Conservancy lands and includes partnerships with other private, state, and federal landholders within seven community-based programs. The Conservancy is an integral part of several large cooperative weed management efforts including the Weed Prevention Area surrounding the Matador Ranch, the Blackfoot Challenge CWMA in the Ovando Valley, and the Red Rock Watershed CWMA in southwestern Montana. The Conservancy expended about \$64,800 in 2004 for labor and materials to implement integrated management of noxious weeds on their lands and provide support, guidance and leadership on adjoining CWMAs.

In January 2004, 11 land trusts operating in Montana held 1,500 conservation easements on 1,346,163 private acres in the state (NRIS 2004). Although these organizations have adopted Land Trust Alliance Standards and Practices, there are no formal guidelines for weed management on conservation easements.

Program Needs

- 1) Promote, develop, and facilitate CWMAs on lands encompassed with conservation easements, with other private landholders, and county, state, and federal agencies.
- 2) Encourage Montana Land Trust organizations to adopt policies that promote early detection and management of noxious weeds on lands encompassed by conservation easements.

PRIVATE INDUSTRY

Private industry includes local vendors for herbicides, biological management agents (livestock, insects, pathogens), seed suppliers, plant nurseries, herbicide applicators, inventory and monitoring specialists, and natural resource consultants. Private industry serves as an important link with local individuals and agencies for providing technical assistance, developing and coordinating cooperative weed management projects, and other expertise that supports and promotes weed management in Montana.

Program Needs

- 1) Improve coordination and communication between private industry and local, state, and federal entities on weed management issues; and facilitate technology transfer, public education, and development of CWMAs.

LOCAL GOVERNMENT AGENCIES

A number of local government agencies manage lands in Montana. They include: County Road Department, City Street Department, airports, city and county parks, cemeteries, sewer and water districts, fairgrounds, historical museums, and schools. In

addition, several of our larger cities have programs to help purchase land for the purpose of preserving open space lands. Lands that are managed by local government agencies are often a vector for introduction and spread of noxious weeds. These agencies generally do not have an integrated weed management (IWM) plan, and lack the expertise and resources to carry out an effective vegetation management program. As a result, noxious weeds continue to spread and threaten other non-infested lands.

There is a critical need for local government agencies to have an effective vegetation management program that includes a component on management of noxious weeds. Taxpayers are often critical of government agencies for the lack of weed management, and they expect local governments to set an example and leadership in controlling weeds.

Program Needs

- 1) County Weed District will assist local government agencies in developing IWM programs.
- 2) Local government agencies will work with county weed districts to develop and implement an IWM plan with line-item budgets for weed control.
- 3) Increase weed awareness and support for all aspects of weed management within local governments.

SOIL AND WATER CONSERVATION DISTRICTS

Soil and Water Conservation Districts (SWCD) are local governments established under state law to manage natural resources within their boundaries. Conservation districts cover the entire state of Montana including most cities and towns. Each district has five locally elected supervisors along with two supervisor appointed by incorporated communities within

the district boundary that oversee district activities.

Conservation districts work with local individuals, state, federal and local government agencies to help citizens conserve soil, water and other renewable natural resources. Districts are active with weed management on a local, state and interstate basis. Conservation districts provide information on proper land management and weed control through printed educational materials, and farm and ranch tours. Along with educational efforts, conservation districts sponsor grants that have provided funding for equipment and herbicides for weed management.

Program Needs

- 1) Improve coordination between SWCD, Montana Department of Agriculture, and weed districts to facilitate funding weed management projects at the local level.

PROGRAMS AND LANDS ADMINISTERED BY STATE AGENCIES

Lands administered by state agencies encompass about 5.8 million acres, with Montana Trust Land Management Division of the Department of Natural Resources and Conservation the primary landholder. House Bill 395, passed in 1994, requires state agencies in Montana to develop a six-year management plan to address noxious weed issues on state managed land. Although plans are completed, not all lands have budgets dedicated to management of weeds.

MONTANA DEPARTMENT OF AGRICULTURE (MDA) NOXIOUS WEED PROGRAM

The MDA devotes four FTE (full time employees) to the state weed program, with an

THE MONTANA WEED MANAGEMENT PLAN—EXISTING SITUATION, CURRENT PROGRAM, AND PROGRAM NEEDS

operational budget of approximately \$277,000. The program includes oversight of the Noxious Weed Trust Fund Program, the Noxious Weed Seed Free Forage Program, biological control of weeds effort, Aquatic Vegetation Management Program, technical expertise in all aspects of weed management, support of statewide and regional weed efforts, and coordination of efforts between state, federal, county and private land managers.

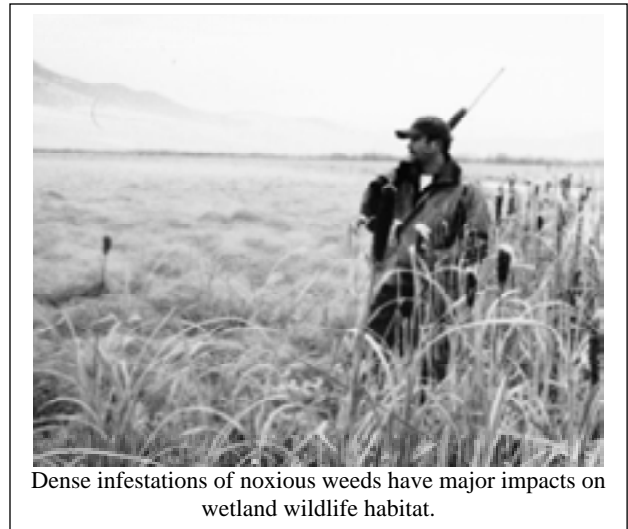
In addition to staff within the Noxious Weed Program, other Agricultural Sciences Division employees lend expertise and assistance to the weed management effort in Montana. These specialist positions include the following services: mapping and geographic information system (GIS); worker protection and certification; soils and ground water; quarantine and nursery; feed; seed; and regional pesticide training.

Program Needs

- 1) Identify and secure revenue sources to increase the permanent trust of the NWTF to \$10 million within the next 5 years.
- 2) Increase funding within the NWTF to allow for additional weed management grants on private lands.
- 3) Enhance weed inventory and data input through improved GIS capabilities or remote sensing.

DEPARTMENT OF CORRECTIONS

Department of Corrections manages 37,720 acres in Montana. Noxious weeds (predominantly spotted knapweed and leafy spurge) infest about 3,000 acres with approximately 50% of the area inventoried. Revenue expended in 2004 for noxious weed control was \$22,545. The ranch manager estimated about \$25,000 annually was needed to



reduce weed spread and treat approximately a third of infestations per year. An integrated program including prevention, release of biological agents, livestock management, and aerial and ground herbicide applications are used to manage noxious weeds on the ranch. A management plan was completed in 2000.

DEPARTMENT OF FISH, WILDLIFE, AND PARKS (FWP)

Montana Department of Fish, Wildlife, and Parks manages more than 480 sites across the state and is responsible for weed management on approximately 404,266 acres. Sites include administrative offices, parks, hatcheries, campgrounds, easements, leases, wildlife management areas and fishing access sites. A state weed coordinator assists managers with organization and implementation of weed management activities.

The number of weed-infested acres on FWP owned and/or managed land was estimated at 30,452 acres in 2003. Detailed information on infested sites is on file with MDA and FWP. Active integrated weed management activities occur on over 19,000 acres. A total of \$503,587 was expended in calendar year 2003 on weed control, education and outreach, grants, and other vegetation management activities.

THE MONTANA WEED MANAGEMENT PLAN—EXISTING SITUATION, CURRENT PROGRAM, AND PROGRAM NEEDS

Revenue expended includes \$250,274 (on-ground weed management); \$99,220 (weed control on trails); \$142,757 (private landowners on Block Management areas); \$1,950 (outreach and education); and \$9,386 (vegetation management of the Capitol complex). The proposed on-ground noxious weed management biennial budget for Fiscal Years 2004 through 2005 is \$469,994 (\$234,997/year). Weed control activities are funded through multiple operations budgets of the Fisheries, Wildlife, Field Services, and Parks Divisions. Future regional budgets would be similar to previous years' expenditures.

Six-Year Weed Management Plans have been completed for both Parks and Wildlife Divisions in the seven regions; two Regions are in the process of updating and revising their plans. Many of the larger Wildlife Management Areas also have site-specific weed management plans in place. For the majority of sites, weed control is accomplished via contract with county weed districts or private contractors.

Program Needs

- 1) Implement statewide inventory standards for mapping and monitoring weed infestations and weed management activities on FWP lands. Incorporate inventory data into statewide system.
- 2) Evaluate and prioritize current FWP noxious weed management practices and focus future efforts on high priority sites.

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION (DNRC) TRUST LAND DIVISION (STATE LANDS)

State Lands Division manages 5.1 million surface and 6.2 million subsurface acres through six Area Offices and 12 Unit Offices. Currently,

the Division has a weed management budget of approximately \$60,000 for projects on state lands. This does not include staff time and expenses for annual biological control efforts. Total acres infested by noxious weeds are unknown and statewide inventories have not been conducted on state lands. Based on 9% of lands infested in Montana, a total of 459,000 acres are infested on state trust lands. The Legislative Performance Audit calculated 21% of state land infested. Weed specialists have estimated that a minimum annual budget of \$300,000 annually is necessary to assess the current status of noxious weeds on state owned lands and develop management strategies. In addition, cost to state-land lessees to stop spread and reduce existing infestations by 5% would be \$1.7 million annually (on-ground management costs only). Therefore, total predicted costs for weed management on state trust lands would be \$2 million.

As lands are inspected in association with leases or other projects (such as timber sales), weed infestations are noted. For leased lands, follow-up contact is made with the lessee and weed management plans or control is required. For other projects, site-specific plans are developed to address weed control during and after those activities.

In 2003, a Legislative performance audit reviewed weed management activities on state land. Based on recommendations from that audit, the Division developed weed management plans for each of its Area Offices. The plans, along with the County Cooperative Weed Agreements required by §7-22-2151. MCA, are intended to meet program needs 1 through 3 described below.

Program Needs

- 1) Identify and record noxious weed infestations on state land for inclusion in the statewide inventory system.

THE MONTANA WEED MANAGEMENT PLAN—EXISTING SITUATION, CURRENT PROGRAM, AND PROGRAM NEEDS

- 2) Establish and implement a process for monitoring weed management efforts for weed infestations
- 3) Establish priorities for funding weed management projects.
- 4) Verify weed management compliance on leased parcels.
- 5) Consider legislation that will authorize DNRC Trust Land Division to conduct weed control on state lands and bill the lessee for those costs in situations when a lessee has been directed to implement weed management actions, but did not control weeds as per the lease contract agreement.
- 6) Review alternative for establishing a grazing lease incentive for weed management.

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION—STATE WATER PROJECTS

The DNRC water project lands include 19,000 acres in the state encompassing 25 water storage projects including canals associated with dams and reservoirs. A weed management plan was completed in 1997 and indicated approximately 2,000 acres infested with noxious weeds at 23 of the 25 sites. The estimated total weed management cost for the period from 1997 through 2003 was \$41,000. The status of noxious weed infestations, progress of weed management efforts, and estimates for weed control were not reported in 2004.

The full-time Land Management/Weed Control Coordinator position for the DNRC State Water Projects Bureau was eliminated 2003. The Environmental Specialist position allocated about 5% of time to coordinating weed management in 2004. Responsibility of weed

control on these lands is the Water User Association's. Section 2 of the Water Purchase Contract states that the water users will be responsible for "all costs of the maintenance, repair, operation, and necessary alteration of the project" and each Association is required to sign the contract to secure water from these reservoirs. The Bureau is in the process of updating the six-year weed management plans, to be completed by the end of FY 2005 with each water user association. Several water users association received assistance for weed management from the Montana Department of Fish, Wildlife and Parks (FWP) and from local Conservation Districts. The Bureau encourages Water User Associations to investigate alternative funding sources. There is concern that increased recreational use and complex land ownership, leasing, and management will complicate weed management activities. An estimated \$30,000 annually is needed for a half-time position for monitoring and coordinating weed programs.

Program Needs

- 1) Establish a minimum half-time weed control coordinator position for State Water Projects Bureau.
- 2) Participate in the Aquatic Nuisance Species Task force programs/projects.

DEPARTMENT OF PUBLIC HEALTH AND HUMAN SERVICES (DPHHS)

The DPHHS manages 1,728 acres, with 975 acres leased to FWP and 160 acres leased to a private individual for ranching. The FY 2004 weed budget for vegetation management (including noxious weed control) on HHS lands was \$7,400. The lessee is responsible for compliance with weed management on leased lands. There is no information regarding noxious weed infestations on these DPHHS lands; however, management is either contracted to

county weed districts or performed as part of maintenance activities.

DEPARTMENT OF TRANSPORTATION (MDT)

The MDT manages about 12,000 miles of centerline road through five District and five Area Offices. Management plans are reviewed annually with each county to determine priorities, funding and plan work schedules. The FY 2004-2005 budget is \$1.075 million of state funds in addition to approximately \$300,000 annually of federal highway funds. There is a formal mapping effort coordinated through MDT. Counties are paid \$2.00 per centerline mile to inventory roadsides for MDT. In FY 2004, approximately half of the counties provided information for the inventory. An estimated \$1.4 million in state funds is needed to improve program performance with annual increases to adjust for increases in rights-of-way and inflation. If these funds are appropriated, the \$1.7 million available annually from both state maintenance budget and federal post-construction funds should prove adequate to manage MDT's rights-of-way. A more detailed description of MDT's weed program is described under transportation corridors in Chapter 3: Plan of Action.

STATE UNIVERSITIES

University of Montana (UM) manages 129 and 483 acres at Fort Missoula and Mount Sentinel respectively, all of which are infested with noxious weeds. In addition to these lands the University also has 28,000 acres at Lubrecht Experiment Station, and 3,400 acres at Bandy Ranch. Weed management budgets for these lands are \$1,500 and \$3,000 respectively. Current weed management budgets for Fort Missoula and Mount Sentinel are \$30,000 for a part-time coordinator, supplies, and travel, with additional grants for weed research.

Montana State University (MSU) has seven Research Centers (Sidney, Huntley, Moccasin,

Havre, Creston, Corvallis, and Conrad) encompassing 7,085 acres. These stations are utilized for noxious weed research and also manage invasive weeds as part of maintenance/operating budgets. In addition to Research Centers, MSU Department of Animal and Range Sciences manages Towne Farm (300 acres), Fort Ellis (700 acres) and Red Bluff Research Ranch (12,662 acres plus 635 acres of state and federal leases) as teaching and research facilities. There is no weed management plan for Red Bluff Ranch; however, about 350 acres are infested with leafy spurge and spotted knapweed. A budget of \$2,000 is allocated annually for herbicide management of weeds on ranch property. Red Bluff would like to expand weed management efforts and implement an integrated weed management program, utilizing sheep grazing, herbicides, and release of biological control agents. An estimated \$52,500 is needed to implement an integrated weed management program at Red Bluff, with about \$9,000 per year to sustain the program.

Program Needs

- 1) Implement IWM programs on university owned lands.
- 2) Identify and secure funding sources to support IWM projects on Red Bluff Ranch.

LANDS ADMINISTERED BY FEDERAL AGENCIES

Cooperation of federal land managers is an integral component of the Montana Weed Plan. Lands administered by federal agencies comprise 27 million acres or about 28% of the total land area in Montana. United States Department of Agriculture (USDA) Forest Service and United States Department of Interior (USDI) Bureau of Land Management manage the majority of these acres. Current status of lands administered by federal agencies is described below.

USDA AGRICULTURAL RESEARCH SERVICE (ARS)

The Fort Keogh Livestock and Range Research Laboratory encompass about 55,000 acres near Miles City, MT. The ARS recognized the importance of noxious weeds in Montana and created two research positions in 2003 to study invasive plants. The Range Ecologist position is currently focused on plant community response to weed management practices and predicting weed invasion potential. The Ruminant Nutritionist position dedicates 65 to 70% of time toward investigating the role and interactions involved between livestock and noxious weeds. This collaborative effort will focus on Category 1 noxious weeds in Montana, and provide valuable information to producers to aid in recapturing or preventing further infestations of noxious weeds on rangeland. Operating budgets dedicated toward invasive plants include about \$99,000 for salaries and \$80,000 for research, with research budgets declining to \$30,000 in 2005. Additional funding for weed research will be required to maintain adequate levels of funding. Most of the research is conducted off-station since Fort Keogh maintains an aggressive noxious weed management program to minimize introduction and establishment of noxious weeds on their lands.

Program Needs

- 1) Increase financial support to facilitate and expand noxious weed research at Fort Keogh.

USDA FOREST SERVICE (FS)

The Forest Service manages about 16.9 million acres in Montana, comprised of nine National Forests and 40 Ranger Districts. An estimated 5% of the land area or 900,000 acres are currently infested with noxious weeds. A more accurate assessment of weed-infested lands is on-going in most Districts and data incorporated into the Natural Resources

Information Service (NRIS) database. The Northern Region noxious weed management program focuses around five major components of the State and National Weed Management Plan. Accomplishments by the FS include 1) *Risk analysis and prevention*: Developed an assessment/map of weed susceptible habitats by species for the southwestern portion of Montana. This assessment is currently being used in forest and project planning efforts to assess the threat of noxious weed invasion. 2) *Management*: Expanded treatment efforts to incorporate aerial application on four national forests. The FS continues to provide an annual grant to Montana for weed management efforts on State, Private and Tribal lands. 3) *Inventory, monitoring and evaluation*: Currently automating the Legacy Weed Inventory data into an agency corporate database in addition to providing information to the Montana NRIS database. 4) *Public awareness and education*: Continues to be a strong supporter and financial contributor to the Montana Noxious Weed Education and Awareness Campaign. (5) *Research*: Research entomologists stationed in Bozeman, MT continue biological control research focused on tansy ragwort, rush skeletonweed, and toadflax.

Forest Weed Plans have been completed under NEPA (National Environmental Policy Act) dating from 1986 to present. An integrated weed management approach is implemented on all lands within the Forest Service jurisdiction. The current budget for noxious weed management is \$1.5 million and it is estimated that \$6 million annually is necessary to adequately contain and suppress current levels of infestations, conduct public education and awareness campaigns, and eradicate new invaders.

Program Needs

- 1) Increase budgets to \$6 million annually to adequately contain and suppress current levels of infestations, conduct public education and awareness campaigns, and eradicate new invaders.

USDA NATURAL RESOURCE CONSERVATION SERVICE (NRCS)

The NRCS increased agency involvement in noxious weed management programs during the past several years. In 2004, NRCS provided \$100,000 to Montana's Statewide Noxious Weed Awareness Campaign and \$100,000 to the Noxious Weed Trust Fund for CWMA projects.

During the past five years, about 8,000 acres of private land in Montana have received \$200,000 for seeding following wildfire, under the emergency provisions of the Environmental Quality Incentive Program (EQIP). In addition, Emergency Watershed Protection Program has provided funding to seed about 10,000 acres of private lands at a cost of about \$25 per acre for a total value of \$250,000 dollars. While a primary purpose of seeding is to prevent erosion and reduce the immediate threat of damage to private property and life after wildfires, a secondary and longer-term purpose is to establish vegetative cover to reduce the competitive advantage of invasive species.

The NRCS also provides technical assistance for invasive species management on private lands and occasionally on collaborative public lands projects. The annual value in dollars of this technical assistance is not known, but results in a substantial contribution to the noxious weed control efforts in Montana each year.

Program Needs

- 1) Increase involvement of NRCS employees in development and facilitation of CWMAs.
- 2) Enhance training opportunities for NRCS employees on implementing IWM programs on non-crop sites.

USDI BUREAU OF LAND MANAGEMENT (BLM)

The BLM manages about 8 million surface acres in Montana, comprised of seven Field Offices, two Field Stations, and two National Monuments. Integrated weed management is mentioned in BLM management plans and activity assessments. An estimated 14% or 1,116,058 acres are currently infested with noxious weeds. The Northwest Noxious Weed Control Environmental Impact Statement (EIS) and Supplements were completed in 1985 and 1987 respectively, and the Vegetation Treatment EIS was completed in 1991. The National Vegetation EIS that includes noxious weeds and other invasive non-native plants should be available for review by early 2005. The BLM established Assistance Agreements (AA) with 44 counties in Montana for management of noxious weeds. The Bureau supports biological control research providing funding to Commonwealth Agricultural Bureau International (CABI), ARS, APHIS, University of Idaho, and Montana State University. The Bureau has four personnel with degrees in weed management in Montana. Currently the BLM is in the developmental stages of a Memorandum of Understanding (MOU) with Department of Agriculture, and other agencies. The current annual budget for weed management in Montana is \$1.5 million. Because of the generally scattered land pattern of BLM-administered lands, cooperative efforts are a vital part of the BLM's integrated weed management program.

Program Needs

- 1) Continue to develop county partnerships.
- 2) Increase budgets to \$6 million, through appropriation increases and leveraging cost-share funding, to adequately contain and suppress current levels of infestations, conduct public education and awareness campaigns, contribute to

research, and conduct rehabilitation projects.

USDI FISH AND WILDLIFE SERVICE (FWS)

The FWS recognizes invasive species as one of the major threats to conserving native plant and animal populations. The Service manages about 1.3 million acres in Montana, including 22 National Wildlife Refuges, five Wetland Management Districts, two National Fish Hatcheries, and a combination Fish Technology Center/Fish and Wildlife Management Assistance Office. In addition to these federal lands, the Partners for Fish and Wildlife Program assists private landowners in enhancing habitat and developing invasive plant management plans in the Blackfoot River watershed, Centennial Valley and Big Hole River Conservation Focus Areas, and in the East Front of the Rocky Mountain Conservation Focus Area. In 2003, there were 44,770 acres or 3.4% of Service lands surveyed for invasive plants, and 22,921 acres treated for noxious weeds on Service lands in Montana. In 2004, FWS organized an exotic plant management team in Montana to control high-priority invasive plants on Service lands throughout the state. The FY2005 budget is \$200,000 in Montana that funds two Exotic Plant Management Teams, but does not include individual refuge manager time toward weed management activities. The FY2006 budget request is \$250,000.

Program Needs

- 1) Increase budgets to \$600,000 annually to stop spread and reduce present infestations by 5% through implementation of IWM.

USDI NATIONAL PARK SERVICE (NPS)

The NPS manages 1,124,543 acres in Montana within eight units. Glacier National



Glacier National Park.

The National Park Service manages 1,124,543 acres in Montana. New exotic plant invaders are a top priority for treatment in Parks, regardless of their legal status.

Park, Yellowstone National Park and Bighorn Canyon National Recreation Area (draft) have weed management plans; however, all units have annual weed management programs. The eight units estimate having 3,509 acres of noxious weeds and currently spend about \$285,440 annually on education, prevention, inventory and mapping, control, and monitoring; which includes approximately \$100,000 contributed by the NPS Northern Rocky Mountain Exotic Plant Management Team (EPMT). New exotic plant invaders are a top priority for treatment in Parks, regardless of their legal status. Glacier and Yellowstone National Parks are formal participants in weed management areas, although all park units are actively cooperating with area weed program managers. The combined estimated annual weed program budget needs for the eight parks for weed management in Montana is about \$530,000. Monitoring, research, and management of weeds on NPS lands are limited due to budget restraints. A brief description of National Parks follows.

- ***Nez Perce National Historic Park—Big Hole National Battlefield*** encompasses 656 acres in Montana with an additional 250 new acres expected within the next two years. About 50 acres are infested by noxious weeds mostly along trail and

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- road corridors. Estimated program budget needs are \$12,000 with an additional contribution. Current FY 2005 budget is \$8000 with \$3000 of that amount from EPMT.
- **Nez Perce National Historic Park—Bearpaw Battlefield** encompasses 190 acres in Montana with an estimated 15 acres infested with noxious weeds mainly along trails and fence corridors. The current budget for noxious weeds is \$500 from EPMT that is contracted to counties. This funding is adequate for current infestations.
 - **Bighorn Canyon National Recreation Area** encompasses 68,491 acres with 41,095 acres in Montana. About 200 acres are infested with noxious weeds in Montana with an annual weed budget of \$6500 (MT only). Estimated budget needs are \$57,000 (Montana portion).
 - **Glacier National Park** encompasses 1,013,572 acres in the Hudson Bay and West Lake districts. An estimated 1,304 acres are infested with noxious weeds. The Exotic Vegetation Management Plan was updated in 2004 and action plans are written and/or revised annually. The weed program has four full time employees with a FY 2005 budget of \$239,240 annually including BAER (Burned Area Emergency Rehabilitation) funds. It is estimated that a total annual weed management budget of \$320,000 is needed to adequately address the weed problem.
 - **Grant-Kohrs Ranch National Historic Site** encompasses 1,500 acres with 800 acres infested with noxious weeds. The weed management budget was \$10,000 in FY 2005 with \$35,000 needed to adequately manage current infestations.
 - **Little Bighorn Battlefield National Monument** encompasses 765 acres with 100 acres infested with noxious weeds. In 2004, the weed management budget was \$3,000 with \$10,000 needed.
 - **Fort Union Trading Post National Historic Site** encompasses 460 total acres with 112 acres in Montana. Noxious weeds infest about 40 acres in the MT portion of the park. There is no weed management plan as of 2005; however in FY 2005 the weed management budget was \$5000 park-wide. About \$1200 of the budget was utilized in MT in addition to \$1200 contributed by the Great Basin EPMT. Estimated weed program budget needs are \$18,000 park-wide with \$4,320 needed for Montana, plus continued support from the Great Basin EPMT of \$1200.
 - **Yellowstone National Park (YNP)** Yellowstone National Park encompasses 2.2 million acres, including 66,653 acres in Montana. The park's Exotic Vegetation Management Plan was completed in 1986 and is presently under revision. In 2004, the park program focused on education, prevention, participation in 6 cooperative weed management area partnerships, treatment of 15 new invaders, and containment of 10 established species. Staff surveyed 3000 acres; however, the majority of park's backcountry, outside of trails and campsites, has not been inventoried. Most high priority species have been contained to the roadsides and developed areas; however, there are widespread infestations of Dalmatian toadflax and Canada thistle with an estimated 1000 acres occurring in the Montana portion of the park. In 2004, about \$200,000 was committed to weed management, with Montana's portion

equaling about \$20,000. Projected park-wide estimates to contain and manage existing infestations, prevent new invasions, increase public awareness, and stop newly invading species is \$400,000 with an additional one-time funding of \$500,000 for infrastructure, research, and equipment. The Montana portion of program needs is \$40,000 for operations, plus \$50,000 for infrastructure.

Program Needs

- 1) Increase the budget to \$530,000 for NPS lands in Montana for monitoring, research, and management of noxious weeds on NPS lands.

BUREAU OF RECLAMATION (BOR)

The BOR manages approximately 200,000 acres of land in Montana while reservoirs comprise another 110,000 water surface acres. These areas are managed through two Regional Offices, two Area Offices, and five Field Offices. There are two on-going inventory efforts, but no estimates of acres infested by noxious weeds. Reclamation has 13 reservoir project areas east of the continental divide and Hungry Horse Reservoir west of the divide. Reclamation directly manages lands surrounding four reservoirs. Other Reclamation lands are administered by other agencies, including the FS, NPS, FWP, and by Irrigation Districts. Current funding for Reclamation/County cooperative agreements totals \$63,000. Weed control coordination efforts are not funded separately from other land management activities. It is estimated that an annual budget of \$190,000 would be needed to support a full-time coordinator, continue control agreements, and reduce current weed infestations by 5%.

Program Needs

- 1) A full-time weed coordinator position.

- 2) Develop and implement a statewide weed management plan for BOR lands.
- 3) Increase the annual budget to \$190,000 to support a full-time coordinator, continue weed management agreements, and reduce weed infestations by 5%.

LARGE CORPORATE LAND OWNERS

Large corporate landowners are an important component of the Montana Weed Plan. Plum Creek Timber Company manages 1.3 million acres in the state in four management units including Missoula, Seeley Lake, Kalispell, and Libby. The number of acres infested by noxious weeds is unknown at this time. Each office has a broad-based weed management plan. Budgets for noxious weed management are part of other program costs and allocated and spent on a case- by- case basis. The analysis for financial resources necessary to adequately address weed issues has not been completed. Costs for these acres were included in figures for private land managers.

Plans and programs for utility companies and railroads are listed under “Special Management Zones” in Section IV Plan of Action.

TRIBAL LANDS

The Bureau of Indian Affairs (BIA) is divided into twelve regions nationally. The Rocky Mountain Region includes tribal lands in Montana and Wyoming. In Montana, seven reservations comprise approximately 5.3 million acres of trust land, with an estimated 722,456 acres or 13% of trust land infested by noxious weeds. BIA has a national noxious weed budget of \$2 million, with half of the funds given to regions based on historic or current program needs. Funding for weed management projects are dedicated only to tribal trust lands. There are no positions in BIA dedicated to Noxious Weed Management. Noxious weed management

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efforts or activities completed by the BIA are conducted as adjunct duties within other disciplines such as Soil Conservationist position. However, the Montana BIA office continues to compete nationally for funding of local weed management efforts.

Noxious weed management at various reservations varies greatly depending on interest, commitment, and supervisors' demands. The BIA contributed \$7,000 to the Statewide Noxious Weed Awareness and Education Campaign Task Force for a two-year program (2003/2004) to promote noxious weed awareness for residents of reservations, allotments, and trust lands. Increased communications resulted in the Blackfeet Reservation initiating a reservation-wide noxious weed management plan and proposed hiring of a weed coordinator. There is potential to expand the weed management plan concept to Ft. Belknap Reservation. The BIA will contribute \$5,000 to the Statewide Campaign for FY 2004-2005 to continue supporting these two activities and weed awareness efforts. The BIA has encouraged tribes to engage and participate in state weed plan activities and/or develop local weed management plans.

Total funding allocated to weed management in FY 2004 was \$403,865. Reservations estimate that about \$975,000 annually is needed to adequately address weed management issues on trust lands. Acres of tribal trust land shown below do not include fee or leased lands.

- **Blackfeet Reservation** manages 962,000 acres of trust land. About 80,000 acres are infested with noxious weeds on trust lands. The FY 2004 weed management budget was \$46,070 with a required annual budget of \$200,000 to adequately address noxious.
- **Crow Reservation** manages 1.5 million acres of trust land. Approximately 126,500 acres are infested with noxious

weeds. The FY 2004 weed management budget is \$103,940 with annual budget needs of \$250,000 to adequately address noxious weeds.

- **Flathead Reservation** manages 825,000 on tribal owned lands and about 60% (495,000 acres) of that area is infested with noxious weeds. The FY 2004 weed management budget for these lands was \$150,000 and it is estimated that \$300,000 annually is needed to adequately manage noxious weeds.
- **Fort Belknap Reservation** manages 617,000 acres of trust land. Noxious weeds infest about 6,680 acres. There was no funding allocated for noxious weed management in FY 2004. It is estimated that \$60,000 annually would be needed to address noxious weeds on trust lands.
- **Fort Peck Reservation** manages 913,000 acres of trust land with approximately 3,280 acres infested with noxious weeds. An Environmental Assessment and management program were developed on noxious weeds in 1988. The FY 2004 weed management budget was \$9,630 with an annual budget of \$50,000 needed to adequately manage current infestations.
- **Northern Cheyenne Reservation** manages 442,000 acres of trust land with about 9,200 acres infested with noxious weeds. The FY 2004 weed management budget was \$59,860, with an annual budget of \$75,000 needed to adequately manage current infestations.
- **Rocky Boy's Reservation** manages 111,000 acres of tribal Trust lands with about 1,796 acres infested with noxious weeds. The FY 2004 weed management budget was \$34,365 in addition to tribal funds. It is estimated that \$40,000

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annually is needed to adequately address
noxious weeds on trust lands.

Program Needs

- 1) Establish a Noxious Weed Coordinator
position within BIA.

- 2) Increase the annual budget for noxious
weed control to \$975,000 to adequately
address weed management issues on
trust lands.

Chapter 3

Plan of Action



CHAPTER 3 - PLAN OF ACTION

The magnitude and complexity of the noxious weed problem in Montana requires a comprehensive plan of action that includes five major components. These components are: 1) risk analysis and prevention of introductions into non-infested sites or ecosystems; 2) early detection and rapid response of newly invading species and implementation of best management practices for species that are widely established; 3) inventory weed populations and monitor and evaluate results to measure progress towards goals; 4) public outreach, awareness and education; and 5) research. Any strategy for management of noxious weeds should be compatible with the overall management plan for the ecosystem.

Effective management of noxious weeds depends upon several underlying capabilities: 1) strong local, state, and federal leadership; 2) establishment of priorities based upon a science-based assessment of risks, 3) ready access to current scientific and management information, 4) strengthening of laws and regulations, 5) coordination and cooperation between agencies, between different levels of government, and between the public and private sectors, 6) development of stable funding to sustain current programs and initiate new projects; and 7) elevated public awareness, empowerment to implement integrated weed management strategies, and support of weed management efforts.

In summary, management of noxious weeds, and protection and restoration of habitats are critical issues. The lack of a comprehensive weed management program will lead to continued habitat degradation and displacement of native biodiversity. Management actions must be based upon principles and practices consistent with current science, and use prevention, detection and rapid response, control, grazing, and restoration to meet management objectives.

LEADERSHIP AND ORGANIZATION

Leadership and organization at the county, state, and federal level are critical for directing noxious weed programs, implementing state weed laws and directives, and allocating limited resources. Providing consistent local and statewide leadership and organization is important to the success of this Plan. Current programs for the following entities are described in detail in Chapter 2. This section identifies leadership needs to strengthen Montana's weed management efforts and facilitate implementation of this Plan.

MONTANA WEED CONTROL ASSOCIATION (MWCA). The MWCA is a state organization committed to management of noxious weeds in Montana. The MWCA will support and facilitate adoption of this Plan by developing and strengthening task forces for each of the five major components described above. The Steering Committee, as part of the MWCA, will coordinate the five task force groups, consolidate information regarding plan implementation, monitor progress of plan components, and provide direction for adoption of this Plan.

COUNTY WEED DISTRICTS. The 56 County Weed Districts in Montana provide an important role in organization, implementation, and oversight of local weed management programs. County weed coordinators are a primary contact for private land managers who own 63% of land in the state. Counties are also responsible for implementing the state weed law.

STATE AND FEDERAL NATURAL RESOURCE AND LAND MANAGEMENT AGENCIES. State and federal land management agencies control 35% of land in Montana. Their leadership, support, and cooperation on weed management efforts are critical to the success of weed management efforts in Montana.

MONTANA DEPARTMENT OF AGRICULTURE. The Montana Department of Agriculture (MDA) is the primary state agency providing leadership for noxious weed management. The number and diversity of national, regional, and state noxious weed issues necessitates the need for leadership and organization at the state level. The MDA will continue to work with the Montana Weed Control Association, and federal, state, county, and private entities to insure coordination and oversight of weed management programs at the state and national level.

Need for Action

- 1) Develop leadership and strengthen MWCA Task Force Committees that will direct and facilitate implementation of Plan components.
- 2) Increase funding for the permanent trust of the NWTF to \$10 million.
- 3) Secure long-term, stable, adequate funding to support County Weed Coordinators and Reservations.
- 4) Establish full-time weed coordinator positions in each county or multi-county area in Montana.
- 5) Facilitate endorsement of the Montana State Weed Management Plan by local governments, tribal, county, state and federal agencies, and public.
- 6) Update county, state, tribal, and federal weed management plans to complement and support the Montana State Weed Management Plan.
- 7) Establish weed coordinator positions in state and federal agencies to meet program needs.
- 8) Facilitate development and implementation of IWM plans for local government and agencies that complement the Montana State Weed Management Plan.



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Montana's certified weed seed free forage program plays a critical role in preventing introduction of noxious weeds into pristine areas. Certified weed seed free forage is required on Montana's federal land.

RISK ANALYSIS AND PREVENTION

The majority of weed management programs in Montana focus on land that is dominated by noxious weeds. An equal if not greater effort should be made to prevent their spread into lands that remain uninfested. Preventing weed invasion is the most ecologically sound and economical land management strategy. This includes the ability to predict which noxious weed species are likely to enter the state and implement education, regulation, inspection, and/or quarantine programs to prevent entry of those species.

A comprehensive, systematic approach for preventing introduction and spread of noxious weeds into healthy ecosystems in Montana is critical to the success of this plan. The protection of healthy ecosystems from introduction and spread should be made on a site-specific basis to maximize efforts and resources. A successful prevention program includes the ability to: 1) prioritize healthy ecosystems in Montana and predict which noxious weeds will invade these areas; 2) engage and educate landowners to manage and protect weed-free areas from invasion; 3) collect and record information on pathways and spread vectors; 4) implement sampling frequency based on invasion probability to improve rapid response; 5) promote and implement proper ecosystem management to encourage desirable plant

communities and minimize weed invasion; 6) refine management strategies to meet the specific needs of landowners.

Prevention guidelines for counties and land management agencies have been published by the Center for Invasive Plant Management (CIPM). The guidelines summarize information provided by the Prevention Task Force, and federal agencies. Information included in the guidelines and a source for the publication is summarized in Appendix E.

Current Program

- 1) Prevention Task Force, CIPM, and agencies developed weed prevention guidelines for county weed districts, land management agencies, realtors, private corporations, and other landowners.
- 2) The Invaders Database at University of Montana is used to track weed introduction and spread in the Northwest.
- 3) County weed districts and Extension offices are prioritizing and protecting healthy rangelands from weed spread. They are using the CWMA concept to unify landowner groups to work collectively in preventing the invasion of additional lands.
- 4) Certified weed seed free forage is required on Montana's federal land. Additionally, state agencies and public utilities are required to use certified mulch in construction and reclamation projects.
- 5) The Noxious Weed Seed Free Forage Act and Rules and the North American Weed Management Association minimum regional standards have been in effect since 1995. Both programs are reviewed and updated annually.
- 6) A communication network regarding new and potential invaders exists with surrounding states and within Montana between Department of Agriculture, Universities, federal and state agencies, and

counties.

- 7) The MDA Nursery Program communicates with the Montana Nursery and Landscape Association on invasive, and state-listed noxious weeds. Through routine nursery inspections, meetings and trade shows, and newsletters, MDA provides educational outreach to this industry regarding weeds sold for ornamental purposes.
- 8) Public education program on newly invading weed species.
- 9) Noxious Weed Trust Fund has allocated \$3.4 million since 1985 (average about \$500,000/year since 2000) for control/eradication programs for newly introduced species into Montana lands; however, this funding is limited especially for established new invaders such as saltcedar, tansy ragwort, and hawkweeds. The NWTF also allows for emergency funding, approved by the Governor, for noxious weed emergencies including new invaders (utilizes principal from the permanent weed trust).

Need for Action

- 1) Ensure Montana's efforts complement APHIS programs regarding introduction of exotic species quarantine and control including national and regional early detection/ rapid response system.
- 2) Early Detection/Rapid Response of newly introduced species (covered under Management section).
- 3) Work with federal funding agencies to assure compliance with Executive Order 13112¹.

¹ Presidential Executive Order 13112 on Invasive Species (1999): to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause

- 4) Include monitoring and regulatory protocols in the proposed MDA Nursery Program Procedures Manual regarding nurseries and other mail-order outlets that distribute plants into and within Montana.
- 5) Identify and delineate uninfested ecosystems within the state as part of current inventory and mapping system.
- 6) Develop site-specific prevention strategies that include identifying pathways for weed invasion.
- 7) Enhance communication and education of invasive species professionals to facilitate early detection and eradication/control of newly invading species.
- 8) Improve distribution of state authorized "weed alerts" with photographs and biological information.
- 9) Create a Category 4 watch list that will provide authority to stop nuisance and noxious weed distribution in Montana.
- 10) Establish incentives to encourage noxious weed seed free forage production to enhance existing laws.
- 11) Encourage implementation weed prevention strategies as outlined in CIPM Prevention Guidelines (Appendix E).

MANAGEMENT

Management of noxious weeds in Montana is divided into three priorities based on the status of the weed in the state. These include non-established new invaders, established new invaders, and those that are widespread in portions of the state. Specific action plans outlining goals, objectives, and management criteria have been developed for tansy ragwort, rush skeletonweed, yellow starthistle, hawkweeds, purple loosestrife, dyers woad, and

saltcedar by specific task forces. Management of widespread weed species is based on county priority and acres of the weed in the county. An integrated weed management approach will be implemented in all weed management programs.

In addition to prioritizing weeds, Special Management Zones are identified which include transportation and utility rights-of-way, and waterways. Action plans and needs have been identified for these management zones.

NON-ESTABLISHED NEW INVADERS

Non-established new invaders are the highest priority in Montana. Category 3 state-listed noxious weeds that are considered non-established new invaders include yellow starthistle, common crupina, and Eurasian watermilfoil.

Current Program

- 1) Eradication of existing infestations.
- 2) Monitoring of existing sites of introduction and eradication where necessary.
- 3) Targeted educational efforts, including state- and county-wide weed bounty programs on common crupina and yellow starthistle, is on-going. Other



Yellow flag iris is an established new invader in Montana

methods described under current program for Risk Analysis and Prevention.

- 4) A management plan is written for yellow starthistle.

Need for Action

- 1) Follow Risk Analysis and Prevention “needs” (see above).
- 2) Identification of high-risk areas for invasion.
- 3) Establish “Emergency” weed funds for rapid response to new invaders (see Established New Invaders).
- 4) Establish new invaders task force for rapid response.
- 5) Development of species-specific management plans as needed.

ESTABLISHED NEW INVADERS

Newly invading species that are established are the second management priority in Montana. These species include Category 2 and 3 weeds, dyers woad, hawkweeds, perennial pepperweed, purple loosestrife, rush skeletonweed, saltcedar (tamarisk), tall buttercup, tansy ragwort, and yellow flag iris. The goal for these species is long-term, high-intensity containment and control program of current infestations and prevention of movement to non-infested sites.

Current Program

Since 1985, the Noxious Weed Trust Fund, in addition to private, county, regional and federal partners, has provided \$8.6 million in revenue and other resources for management of established new invaders (Table 3.1). The increase in the number of new species, and locations and acres infested by these weeds has greatly expanded the amount of funding required for management. An average of about \$1.3 million annually was allocated toward management of established new invaders in

Montana from 2000 through 2004. These funds are not adequate to contain and control current levels of infestations.

In addition to financial support of management efforts by private, county, state and federal entities, the following activities are on-going for established new invaders:

- 1) Inventory of existing infestations as funding and resources allow.
- 2) Targeted educational efforts, including state- and county-wide weed bounty programs on hawkweed, purple loosestrife, yellow starthistle, and rush skeletonweed, are conducted through various county, private, state, and federal organizations and agencies.
- 3) Regional or statewide task forces have been formed and management plans written for purple loosestrife, tansy ragwort, saltcedar, and rush skeletonweed.

Need for Action

- 1) Organize a Task Force and develop a written management plan for newly invading species that are not covered under existing task force operations.
- 2) Revise existing management plans to include management budgets.
- 3) Provide funding for task force operations (funds should be from partnerships with private, county, state, and federal entities).
- 4) Coordinate the hawkweed program at a regional level.
- 5) Develop a fund for \$4.7 million for management of new invaders, task force operations, and support of SWAT team.
- 6) Evaluation and monitoring of existing management efforts.

- 7) Annual updates and refinement of weed inventories.

WIDESPREAD WEED INFESTATIONS

The third management priority is those species that are widespread in Montana (Category 1 weeds). Priorities for management of Category 1 weeds may differ at the local or county level based on abundance of the weed within a specific area, or land management goals and objectives. For example, a containment strategy may be the best management objective for spotted knapweed in western Montana, but in eastern Montana, eradication or high-intensity management may be the goal.

The statewide management goal for spotted and diffuse knapweed is containment and implementation of IWM methods within Weed Management Areas (WMA's) in the western half of the state, and high-intensity management in the eastern half of Montana. Management of other species within the Category 1 designation are containment and implementation of IWM methods within CWMA's. A description of CWMA's is in Appendix F.

Current Program

- 1) Management of existing infestations as funding and resources allow, mostly within CWMA's.
- 2) Support of CWMA's by the Noxious Weed Trust Fund, and other granting institutions, and agencies.
- 3) Inventory of existing infestations as funding and resources allow.
- 4) Public awareness and education on impacts caused by Category 1 weeds and quick reference guides to IWM methods.

Need for Action

- 1) Increase funding levels for county, state, and federal entities to provide long-term, consistent revenue for weed programs.
- 2) Expand CWMA concept to optimize weed management efforts, partnerships, and ability to attract regional, federal, state, and private grant revenue.

Table 3.1: Amount of NWTF revenue and matching funds allocated toward management of established new invaders from 1985 through 2005.

Weed Species (year project initiated)	NWTF (1985-2000)	Cooperators (1985-2000)	NWTF (2000-2004)	Cooperators (2000-2004)	Total Cost
Dyers woad (1985)	\$ 118,658	\$ 65,219	\$ 91,206	\$ 58,349	\$ 333,432
Hawkweeds	0	0	420,842	970,065	1,390,907
Perennial pepperweed	0	0	13,090	22,895	35,985
Purple loosestrife (1989)	173,825	214,453	132,929	252,346	773,553
Rush skeletonweed (1994)	193,524	196,278	274,252	315,668	979,722
Saltcedar (2000)	33,200	56,810	339,250	564,439	993,699
Tall buttercup	0	0	146,713	148,030	294,743
Tansy ragwort (1994)	429,715	686,641	931,001	1,385,053	3,432,410
Yellow flag iris	0	0	78,455	103,510	181,965
Yellow starthistle	0	0	60,591	151,020	211,611
Total	\$ 948,922	\$ 1,219,401	\$2,488,329	\$ 3,971,375	\$8,628,027

- 3) Promote and assist with implementation of Integrated Weed Management systems.
- 4) Develop cost-share programs for weed management on private lands.
- 5) Increase educational efforts on "TIPS" and developing land management plans that include IWM principles.
- 6) Prepare educators to train individuals on adoption and implementation of IWM methods to achieve desired land use goals.
- 7) Increase publicity of cooperative IWM programs by land managers.

SPECIAL MANAGEMENT ZONES

HIGHWAYS/ROADWAY

Highway/roadway rights-of-way are a high-risk area for introduction of new weeds to the state and can serve as a major site of spread of established noxious weeds in Montana. These corridors also serve as a key avenue for movement of weeds into non-infested sites. The Montana Department of Transportation (MDT) manages Interstate, National and Primary Highways, and Secondary Highways. Acreage encompassed by rights-of-way is estimated between 120,000 and 150,000 acres. Road construction activities such as widening and straightening existing highways, add about 300 to 500 acres of new right-of-way per year.

Future queries of MDT's new weed inventory will provide a more accurate record on weed infestations along most MDT rights-of-way.

Current Program

MDT has five District offices accountable for 10 Maintenance Areas, with one central contact for weed control program oversight. Each of the 10 Area Maintenance Chiefs meets annually with county weed district supervisors within their jurisdiction to discuss budget and



Highway/roadway rights-of-way are a high-risk area for introduction of new weeds to the state.

control priorities. Monies are allocated primarily upon previous year's use and paid by reimbursements through invoices submitted by the counties. Total MDT monies available statewide for integrated vegetation management is approximately \$1.4 million after January 1, 2004.

County weed boards establish weed management priorities. The current system allows local landowners greater influence over what type of weed control is conducted along roadways adjacent to their properties. The Department has written and adopted cooperative plans for weed management on rights-of-way. MDT is actively pursuing the letting of contracts for noxious weed control for their rights-of-ways. An Integrated Weed Management Plan has been drafted as part of a statewide vegetation management plan.

Construction Sites and Reclamation of disturbed rights-of-way

- The MDT must allow county weed boards to review and comment on the reclamation specifications for all road construction projects that disturb ground off the driving surface.
- Some counties now require approval of borrow sources prior to any material placement within right-of-ways, as well as power-washing of all equipment brought into construction project areas.

- The Standard Specifications for Road and Bridge Construction—1995 Edition provided strong direction to construction contractors to abide by the County Weed Management Act. Standard Specification 107.11.5—Noxious Weed Management instructs all bidders to "Determine the specific noxious weed control requirements not specified in the [Construction] Contract of each county where the project is located before submitting a bid."

Need for Action

- 1) Finalize MDT Statewide Integrated Weed Management Plan.
- 2) Continue to improve monitoring and evaluation of weed management efforts on rights-of-way.
- 3) Periodically review reimbursement programs to county weed districts to increase efficiency and improve administration.
- 4) MDT contracts will mandate that contractors contact county weed districts for reclamation requirements on roadside projects and monitor reclamation projects on a regular basis.
- 5) Increase funding for weed control on highway rights-of-way to meet expansion of rights-of-way in the state.

RAILROADS

The introduction and establishment of noxious weeds, and their subsequent spread from railroad lands to adjoining private, state, and federal lands is documented in Montana. Controlling establishment and spread of weeds on these rights-of-way is critical for managing weed populations in Montana and protecting non-infested sites. Burlington Northern (BN) Montana Rail Link (MRL), and Union Pacific (UP) are the principle railroads in the state. Union Pacific contracts about \$14,500 annually to Beaverhead and Butte/Silver Bow Counties

combined, for management of noxious weeds on 113 miles of track. Funding is inadequate to control weeds on Union Pacific ROW in these counties. Private contractors are utilized for noxious weed control on MRL and BN rights-of-way. Montana Rail Link did not report current acres of noxious weeds treated in 2004; however, previous records indicate between 3,400 to 4,000 acres of right-of-way annually. In 2004, the Western Area Weed Council and MRL initiated development of an integrated vegetation management plan for MRL railroad rights-of-way. Funding of \$48,200 in 2004 allocated to MRL rights-of-way in six western Montana counties is inadequate to meet current weed management objectives. Burlington Northern has 2,168 miles of track in Montana. Based on a ROW width of 200 feet, total acres encompassed by BN ROW is 52,466 acres. In 2004, BN contracted treatment of 8,679 acres of noxious weeds or about 16% of ROW acreage. Budgets for weed management activities on these rights-of-way are not published.

Need for Action

- 1) Identify scope of weed infestations and management issues on railroad rights-of-way.
- 2) Develop strategies to address weed management issues on railroad rights-of-way.

UTILITY RIGHTS-OF WAY

Utility rights-of-way for power, communications, and other public services serve as a major avenue for weed introduction and spread. Most easements are on private ground and weed control responsibility must be negotiated between the utility company and private landowner. Utility companies are required by law (7-22-2152 MCA) to send a copy of the reclamation and weed management plan to the county weed district for any new construction or reconstruction of existing services with major land disturbance. Once projects are completed, responsibility of weed

management reverts to landowner and contract agreement with utility company.

OPEN PIT MINING (GRAVEL PITS)

The Montana County Weed Control Act (7-22-2152 MCA) currently states that any state agency or local government unit approving a mine or other major disturbance shall notify the weed board and submit a written plan specifying revegetation at least 15 days prior to the activity. Several counties, such as Park County, have written “policies” regarding removal and purchasing of gravel, topsoil, rock, sand, etc. The County Weed Control Board is responsible for inspection and approval under county policy. In general, once projects are completed, responsibility of weed management reverts to the landowner or contract obligation between the landowner and excavating company.

Need for Action

- 1) County Weed Districts coordinate with state and federal agencies to work with local pit operators in securing sources of noxious weed free gravel and materials.

WATERWAYS

Montana is dissected with numerous ephemeral and perennial streams and rivers. Major river systems include the Yellowstone, Madison, Missouri, Clarks Fork, Flathead, Bitterroot, Beaverhead, Blackfoot, Ruby, and Big Hole Rivers. Although many of the major streams and rivers originate in Montana, exceptions include the Yellowstone, Tongue, Powder, Little Powder, and Little Missouri Rivers that originate in Wyoming. The Milk River in northern Montana originates in the state but flows through Alberta, Canada before re-entering Montana in Hill County. Montana also contains more than 1,000 lakes and reservoirs. The extremely diverse and abundant waterways of Montana provide equally abundant and diverse habitats for noxious weeds. Noxious weeds associated with waterways can be submerged or emerged and all waterways are at risk of establishment. Land managers should

expect invasion and take steps now to identify and protect non-infested rivers, streams, and water bodies. Once weeds are established, management is difficult since accessibility may be an issue and wet areas restrict the use of certain herbicides.

Rivers, streams, and lakes serve as important transportation corridors for weeds between states and provinces and within Montana. Infested rivers and streams are a source for invasion of upland sites when conditions are favorable. Rivers, streams, and lakes are highly susceptible to invasion as a result of water transport of weed seeds, repeated disturbance associated with flooding, and frequent human activity. Pathways for introduction of aquatic noxious weeds include boats, trailers and other recreational equipment, the aquarium trade, and the ornamental pond industry including nursery and garden centers. Aquatic weeds impact water quality, recreational use of waterways, fisheries, irrigation and drainage ditches. These weeds compete with native species and form dense canopies that displace native vegetation,



Streams and rivers are a valuable resource in Montana.

waterfowl, fish, and other wildlife.

Montana waterways contain sensitive ecosystems that provide important environmental and economic benefits. These fragile areas are under significant threat by the introduction of noxious weeds. Healthy waterway ecosystems perform key functions that maintain water quality and quantity and provide diverse habitat for wildlife and high quality forage for livestock. Recreational use by anglers and bird watchers provides influx to support rural economies. Because people are drawn to these popular sites, they are vulnerable to severe alteration when degraded, resulting in erosion and weed invasion. Protection of healthy waterway ecosystems is a high priority in Montana.

Current Program

- 1) Montana adopted the Montana Aquatic Nuisance Species (ANS) Management Plan in October 2002 and Montana Fish, Wildlife and Parks hired an Aquatic Nuisance Species Coordinator in 2004 to implement the plan. The plan outlines management for all aquatic nuisance species in Montana including aquatic noxious weeds.
- 2) Weed management plans have been written and management efforts implemented for portions of the Smith, Beaverhead, Red Rock,, Big Hole, Stillwater, Marias, Milk, and Blackfoot Rivers, Belt Creek, and several other smaller streams and rivers in the state.
- 3) Detection and management of newly invading species, such as purple loosestrife along the Missouri River and saltcedar in Southeast Montana.
- 4) Monitoring for species currently not established in Montana but have a high potential for invasion, such as the Eurasian watermilfoil (currently established in all states except Montana

and Wyoming).

- 5) Public outreach campaigns to make them aware of the ease of spread of aquatic plants via recreational activities and to educate them on how to prevent their spread and introduction.

Need for Action

- 1) Support ANS Task Force to address prevention of weed introduction and management along streams and rivers.
- 2) Identify weed species that are most adapted to movement along waterways.
- 3) Identify weed-free waterways and water bodies and prioritize protection of these areas.
- 4) Develop guidelines for implementing integrated weed management on waterways.
- 5) Develop partnerships with adjoining states and provinces to determine potential new invaders that could be introduced along waterways.
- 6) Encourage education of waterway users and develop advocacy groups.

TRAILS

Trails built for motorized and non-motorized public use are susceptible to invasion by noxious weeds. These trails serve as corridors for movement of weeds into non-infested sites. Weed control along trails should be a priority within city, state, and federal agencies with jurisdictional authority for trail construction and maintenance. Montana Department of Fish, Wildlife and Parks allocates funding to management of weeds on trails. For 2002-2003, the portion of off-highway vehicle and recreational vehicle trail grants awarded by FWP that was used for weed control and/or weed education and awareness was about \$99,000. There is \$1.6 million in federal funding available through FWP for 2004-2005 trails



Trails built for public use are susceptible to invasion by noxious weeds and can serve as corridors for movement of weeds into non-infested sites.

projects for the creation, completion, maintenance or renovation of recreational trails in Montana which includes a component on weed control. In addition, there is \$300,000 in Off-Highway Vehicle Grant funds available through FWP for 2004-2005. Historically, most of the grants have included a portion of funds for weed education and control. Educational programs on noxious weeds should continue to focus on recreational users of trails and two-track roads.

AIRPORTS

Airports serve as a source of introduction of newly invading weeds and aid dispersal of weed seed. Most airports in the state are under city/county ownership with weed management responsibility of the county weed district. Montana Department of Aeronautics maintains 15 state-owned airstrips. Weed management on state-owned strips is conducted within existing maintenance budgets, often as a contract with county weed districts.

RESTORATION AND RECLAMATION

The terms restoration, reclamation, and revegetation are often confused, and for the purpose of this document are defined as follows: *Restoration* is a return of something to an original or unimpaired condition. *Reclamation* is the reclaiming of degraded lands to productive

or desired use. Reclamation attempts to restore *some* elements of structure and function in an ecosystem. It is considered less ambitious but sometimes more feasible than restoration. *Revegetation* is to cause vegetation to grow again.

Soil or ecological site adapted, desired plants should be restored onto a site where invader species are to be eradicated. Restoration planning to reoccupy the site with desired vegetation should be an integral component of a weed management program when loss or displacement of desirable species has occurred. Without restoration of desired plants, the area is likely to become reinfested with either the same or a new weed species. Disturbed areas, where protection and restoration projects may protect critical habitat or important natural features, should have the highest priority. Areas where restoration has a good chance of success should also be a high priority.

In some cases, revegetation may not be necessary to restore a desired plant community. For example, if a moderately healthy component of the desired vegetation remains on the site, restoration may be achieved through other weed management techniques such as multi-species grazing, herbicide applications, and/or the integration of techniques applied in a manner that addresses how plant communities change naturally. Before revegetation occurs, sites should be evaluated for the presence and composition of desired species to determine if revegetation is necessary. The need for revegetation should be determined before weed treatments occur so that seeding can be done soon after the weeds have been removed and before the treated species or other weed species recolonize the site. Monitoring is required to determine which native species established well and whether a second seeding is desirable.

Although efforts to restore appropriate desired vegetation are being exerted on disturbed sites such as rights-of-way, mining areas, and power and transmission lines, there is limited work of this kind being done on degraded range, pasture and woodland sites. The

state of Montana should support and implement the following restoration activities during the next five years.

Need for Action

- 1) Encourage land managers to evaluate and monitor sites treated for noxious weeds to determine whether restoration, reclamation, and/or revegetation activities are required.
- 2) Develop guidelines for conserving and restoring desirable species and ecosystem function during restoration projects.
- 3) Work closely with federal agency teams on burn rehabilitation plans to incorporate revegetation with other integrated weed management techniques where noxious weeds are present.
- 4) Assist land managers in developing integrated weed management techniques that are based on natural plant community change through succession.
- 5) Evaluate current restoration research, and increase efforts and funding for research related to the enhancement or development of new restoration, revegetation, and reclamation techniques.
- 6) Develop a document containing lists of and uses for desirable species and cultivars in restoration activities.
- 7) Develop seed mixtures for revegetation that may be more resistant to weed invasion.
- 8) Educate the public on the importance of revegetating disturbed and weed-infested sites with appropriate site-adapted desirable species.
- 9) Develop guidelines for multi-species grazing specifically aimed at restoration

and long-term maintenance of sites.

INVENTORY, MONITORING AND EVALUATION

INVENTORY

Inventory standards provided in the Montana Noxious Weed Survey and Mapping System and International Mapping Standards are followed. Montana participates in a national committee to standardize mapping standards.

In 2004, the program was limited by lack of funds and resources to collect and process data. It is estimated that less than 5% of total weed management expenditures in the state are dedicated toward weed inventories and processing data.

There are two levels of inventory adopted in Montana:

1) Plant-based Inventory

The objective of plant-based weed surveying and mapping is to: 1) determine and record locations of noxious weeds in Montana; 2) accurately calculate total number of acres infested for each weed on the statewide noxious weed list; 3) prioritize protection of non-infested areas; and 4) determine how fast noxious weeds are spreading by comparing weed inventories



Monitoring and evaluation are necessary to establish baseline data on site condition and record changes in vegetation trends before and after implementing weed management practices.

over time. Surveys also provide information on weed biology and ecology, help predict high-risk sites for weed invasion, and raise public awareness. This information is critical for identifying boundaries of newly invading species, developing long-term weed management goals and objectives, implementing action plans, evaluating the status of weed management efforts across the state, and establishing early detection/rapid response strategies.

2) Section-based Inventory

The objective of section-based weed surveying and mapping is to: 1) establish an overview of annual change of weed infestations statewide; 2) provide an internet-based reporting system where new information can be added by county weed coordinators and designated land managers; and 3) facilitate a rapid data and information retrieval system. This type of mapping allows for identification of weed movement trends and weed-watch advisories statewide on an annual basis.

Need for Action

- 1) Dedicate 10% of weed management budgets toward inventory efforts.
- 2) Complete section-based inventories on Category 1 weeds.
- 3) Encourage yearly completion of internet-based data collection.
- 4) Encourage county, state, federal, and weed management area participation in the state inventory system.
- 5) Improve efficiency of database management.
- 6) Provide regional and national leadership for weed inventory processes.
- 7) Annually inventory known high-risk sites to prevent weed establishment.

- 8) Establish the weed mapping system headquarters within the Department of Agriculture.
- 9) Continue annual training in use of the mapping system.
- 10) Develop an internet reporting system for detailed plant-based data collection.
- 11) Create a data distribution site for detailed plant-based data.

MONITORING

Monitoring and evaluation are necessary to establish baseline data on site condition and record changes in vegetation trends before and after implementing weed management practices. The purpose of a monitoring system is to: 1) collect baseline field data on existing weed infestations and management practices; 2) compile data to develop effective management decisions; 3) evaluate effectiveness of education, training, and management programs; 4) guide maintenance of weed-free areas and measure effectiveness of prevention strategies over time; and 5) prevent reinvasion of weeds into a treated area.

The level of monitoring will vary based on resources and manpower available. The following components are considered a baseline for monitoring the status of weed management programs.

- Survey size and density of weed infestations and vegetation trends in CWMA's.
- Assess public opinion towards weeds and weed management practices.
- Assemble data on past and current weed management activities within weed management areas.
- Update weed distribution and density maps as an on-going part of a weed management program.

- Characterize sites for ecological and habitat classification.
- Establish both short-and long-term monitoring depending on project objectives.

EVALUATION

Evaluation is relating information obtained from monitoring to the objective of the annual plan of operation. Evaluations will help determine if the weed management program accomplishes the objectives of the plan. Evaluation should answer the following questions:

- Was the weed population adequately suppressed?
- Was the planned procedure used, if not how and why did it vary from the original plan?
- Were weed management costs equal to or less than projected costs?
- What was the affect on the target weed?
- Were there any side-effects to non-target organisms from the treatment?
- Should the treatment be repeated or modified?
- Was funding and manpower available at the appropriate time and were they adequate?
- Was personnel training adequate?
- Make necessary changes to annual plan of operation based on the evaluation.

Need for Action

- 1) Evaluate and monitor noxious weed management programs in Montana.
- 2) Encourage implementation of monitoring and evaluation efforts

following “*Guidelines for Coordinated Management of Noxious Weeds*¹” to measure status of projects.

PUBLIC OUTREACH, AWARENESS AND EDUCATION

The purpose of the public outreach, awareness and education component to the Montana Weed Management Plan is to ensure that everyone in Montana is aware of the serious impacts of noxious weeds on natural resources and citizens, and land managers implement systems-based integrated weed management methods. Strategies used to meet these objectives are based on continuing research and understanding of the dynamic needs, apprehensions and behaviors of Montana residents and people who visit Montana.

Organizations and agencies across Montana have engaged in public awareness and



Raising awareness of the impacts of noxious weeds and educating the public about prevention and management is a critical component of Montana's weed management program.

educational programs on noxious weeds for

¹ Available [Online]
<http://www.weedcenter.org/management/guidelines/tableofcontents.html>

more than 25 years. In 1998, the Statewide Noxious Weed Awareness and Education Campaign Task Force united efforts of these individuals, agencies, and organizations and began implementation of a mass-media awareness campaign for the general public. The Campaign Task Force involved more than 300 individuals in 2004 comprised mainly of volunteers. The objective of the campaign is to gain support from the general public for weed issues through awareness, understanding, and motivation to implement integrated weed management across the state.

Groups and individuals comprising the Campaign Task Force are dedicated to implementing the three major components in the public outreach, awareness and education component of the Montana Weed Management Plan. These three components are: 1) public awareness and motivation to take action; 2) building coalitions and partnerships; and 3) developing training opportunities and support systems for land management professionals. The challenge during the next few years will be to continue current awareness activities and elevate focus on developing training opportunities to strengthen effectiveness of local site-specific and land-user-specific noxious weed education programs.

In addition to the general awareness campaign activity that was initiated in 1998, many organizations, individuals, and agencies are working together to develop and implement local grassroots education programs to meet area- and entity-specific needs. The Montana Weed Control Association Education Committee is actively involved with public education, and is dedicated to enhancing implementation of IWM and enabling the people of Montana to work together in developing, implementing, and refining educational programs based on sound ecological principles. The Montana Weed Control Association views all Montana citizens as their potential membership.

Education on various weed management methods is currently conducted by Montana State University Cooperative Extension Service,

Conservation Districts, County Weed Districts, federal agencies, Montana Department of Agriculture, private contractors, and industry. Training programs are targeted toward weed district employees, agricultural producers, herbicide applicators, private landowners, and county, state, and federal land managers. Information included in education efforts includes: weed identification, integrated weed management methods, herbicide mode of action and fate in the environment, and current research regarding weed management techniques.

Need for Action

- 1) Work with Montana Office of Public Instruction to mandate noxious weed units in State Standards.
- 2) Continue to implement the public outreach, awareness and education Campaign.
- 3) Increase professional training opportunities for noxious weed educators.
- 4) Collect and distribute information about successful programs to targeted audiences through new and existing communications channels.
- 5) Facilitate technology transfer between researchers and land managers.
- 6) Develop, through communications, collaboration opportunities for grass roots IWM
- 7) Develop guidelines that facilitate implementation of IWM.
- 8) Secure funding for collaborative noxious weed educational efforts.
- 9) Enhance working relationships and maintain/update website links.
- 10) Develop priority projects identified by partnerships.



Research provides a scientific foundation for sustainable, ecologically-based weed management. *Knapweed insectary at Whitehall School.*

RESEARCH

Research provides a scientific foundation for sustainable, ecologically-based weed management. More advanced management strategies must be developed to protect Montana's natural resources from invasive weeds. The Weed Research Task Force formed in 1999 identified six general research areas critical for invasive weed management in Montana. Research priorities, objectives, and funding were reviewed and revised in 2004 by a coalition of individuals representing the Center for Invasive Plant Management, Montana State University, University of Montana, Montana Weed Control Association Research Needs Committee, federal agencies, and private industry.

Six research areas are identified: Impacts, Prevention, Weed Biology and Plant Dynamics, Integrated Weed Management, Land Restoration, and Effects of Natural Disasters. Working together with adequate funding, Montana's scientific community will make significant advances in weed management. Technology transfer—the two-way transfer of knowledge between researchers and land managers—is critical for incorporating new scientific knowledge into management strategies. The amount of revenue needed to support research staff to collect data, test hypotheses, compile at least preliminary

results, and begin transferring the technology to a wider audience is estimated at \$4.7million annually.

As noted below, these six Research areas support the *Risk Analysis and Prevention* and *Management* sections of the Montana Weed Management Plan.

IMPACTS (RISK ANALYSIS AND PREVENTION)

- Quantify the effects of weeds on Montana's economy (considering crops, livestock, wildlife, tourism, and sporting revenues). Develop models of how to estimate weed impacts. Develop cost:benefit analysis tools for weed management strategies.
- Quantify current and potential effects of weeds on Montana's ecosystems, including biodiversity change, nutrient cycling, hydrologic cycling, and energy flow. Develop models to estimate ecosystem change in response to weed invasion.
- Quantify the effects of weed management strategies on ecosystems. Monitor and analyze broad ecosystem components (flora and fauna). Train land managers and landowners how and what to monitor.

PREVENTION (RISK ANALYSIS AND PREVENTION)

- Identify invasion routes and mechanisms, favorable habitats, and plant traits correlated with invasiveness of weed species. Develop models predicting invasion.
- Develop and implement "best management practices" to prevent invasion through identified routes.
- Develop and demonstrate economical and effective mapping and monitoring

systems that are appropriate for specific land management objectives.

- Develop management techniques to prevent weed invasion or re-invasion. Explore interactions between plant community diversity, weed seed dispersal, grazing management, and disturbance.

WEED BIOLOGY AND PLANT DYNAMICS (MANAGEMENT)

- Identify factors controlling plant community dynamics. Collect plant community data to identify key points in the life cycle of various species. Identify important environmental relationships that may favor invasion and provide opportunities for effective management.
- Document weed population response to crop rotations, minimum or no-till, and irrigated agriculture. Develop decision-support systems to aid management.
- Investigate the genetics of weeds for the purposes of species identification and to determine population variation. Consider the compatibility of weeds with potential biocontrol agents, the potential for herbicide resistance, and differences in the ecology and spread of weed populations.

INTEGRATED WEED MANAGEMENT (MANAGEMENT)

- Enhance and support consortia involved in biological control as they identify new agents, evaluate agent efficacy in different habitats, and evaluate long-term effects on ecosystems. Evaluate critical interactions among control mechanisms and environmental conditions that may affect efficacy. Improve propagation, distribution, collection, and monitoring of agents.

- Improve the effectiveness and use of herbicides by investigating response and persistence of desirable vegetation. Analyze efficiency of spot treatments vs. broadcast treatments in differing situations. Develop decision-support tools and demonstration sites for effective herbicide use.
- Enhance the use of sustainable grazing for weed management. Develop multi-species grazing systems that decrease weeds, and increase diversity and abundance of desired plant species.
- Develop and demonstrate sustainable, integrated weed management strategies that direct plant communities to a desired state. Investigate interactions and synergism among management strategies. Conduct workshops on adaptive management.
- Develop and improve strategies for agricultural weed management, including crop rotations, prevention of herbicide resistance, and precision agriculture technology. Improve herbicide efficacy by understanding weed biology and response to stresses.

LAND RESTORATION (MANAGEMENT)

- Develop and demonstrate methods for revegetating and restoring disturbed land.
- Improve propagation, establishment, and availability of native and other desirable species for restoring disturbed and weed-infested lands.

EFFECTS OF MAJOR NATURAL EVENTS (MANAGEMENT)

- Determine the effects of major natural events (fire, flood, drought, landslides, etc.) on weed biology, ecology, and spread.



Major natural events such as fire, flood, drought, and landslides can increase a site's susceptibility to weed invasion.

- Determine optimal post-event management for weed-infested areas. Develop management guidelines to minimize weed spread.

Need for Action

- 1) Identify and pursue funding sources for basic and applied research defined in the Montana Weed Management Plan.
- 2) Support Montana University system and other research institutions to pursue research identified in the Montana Weed Plan.

Chapter 4

Budgets for a Comprehensive Weed Management Program



CHAPTER 4 - BUDGETS FOR A COMPREHENSIVE WEED MANAGEMENT PROGRAM

Increased funding is critical to address the current level of weed infestations in the state. From 2000 through 2004, revenue generated for weed management in Montana increased about \$5 million annually. However, the present budget remains inadequate to stop introduction of new species, and slow the spread of existing weed infestations. A balanced comprehensive weed management program that segments funding toward public education and awareness, prevention, early detection, management, and rehabilitation is vital to successfully manage large-scale weed infestations. In addition, a coordinated research effort is necessary to address develop more sustainable, cost-effective weed management techniques.

The percent of total budgets allocated to each critical component of a weed management program were based on the “fire model” described by Steve Dewey, Utah State University (1995), and modified to meet Montana’s needs. Based on weed acreage figures and current weed management budgets, implementing a balanced weed management program that stops the spread and reduces current weed infestations by 5% per year will require about \$47 million dollars annually.

The following budget estimates are based on information provided by county, state, and federal entities, estimates from herbicide sales, and the following assumptions and calculations.

- Weed Status
- A total of 8.2 million acres infested with noxious weeds (estimated 1.1 million acres in cropland and 7.1 million on range, pasture, or wildland).
- Infested acres by land ownership (estimates): 5,000,000 on private land; 400,000 on state land; 2,100,000 federal lands; and 700,000 tribal land.

- Management Assumptions
- Average noxious weed spread rate per year = 10%
- Minimum management cost per acre = \$25/acre
- Consider 5% of Russian knapweed, leafy spurge, and whitetop, 40% of Canada thistle, and 70% of field bindweed is in crop and treated as part of a cropping system. Total area infested on range, pasture, and wildlands is about 7.1 million acres.

Current Program

The current budget for weed management activities is about \$19.3 million dollars annually. Based on 7.1 million acres of range and wildland infested, **the deficit is \$4.9 million for on-ground management and treatment of established new invaders, to maintain current weed populations (stop spread)**¹, assuming all other costs remain fixed. Allocations of dollars into various weed management activities is shown in Table 4.1, and a more detailed description by agency in Appendix G. There are several entities responsible for each management activity. For example, Public Education and Awareness includes portions of budgets from county weed districts, state and federal agencies, the State Weed Education Program, and MSU Cooperative Extension Service. On-ground management includes county weed districts, federal and state agencies, and private land managers.

¹ This deficit is based on treatment of 710,000 acres (10% of 7.1 million acres) at \$25/acre for a total of \$17.7 million. Deduct the current budget \$12.8 million for management and rapid response from the \$17.7 million and the deficit is \$4.9 million.

THE MONTANA WEED MANAGEMENT PLAN—BUDGETS FOR A COMPREHENSIVE WEED
MANAGEMENT PROGRAM

Need for Action

Additional revenue of about \$27.8 million is needed to support weed management efforts of various entities in Montana. Based on current infestation levels, the annual budget necessary to stop weed spread, and reduce current infestation levels by 5% per year through a balanced weed management program is about \$47 million

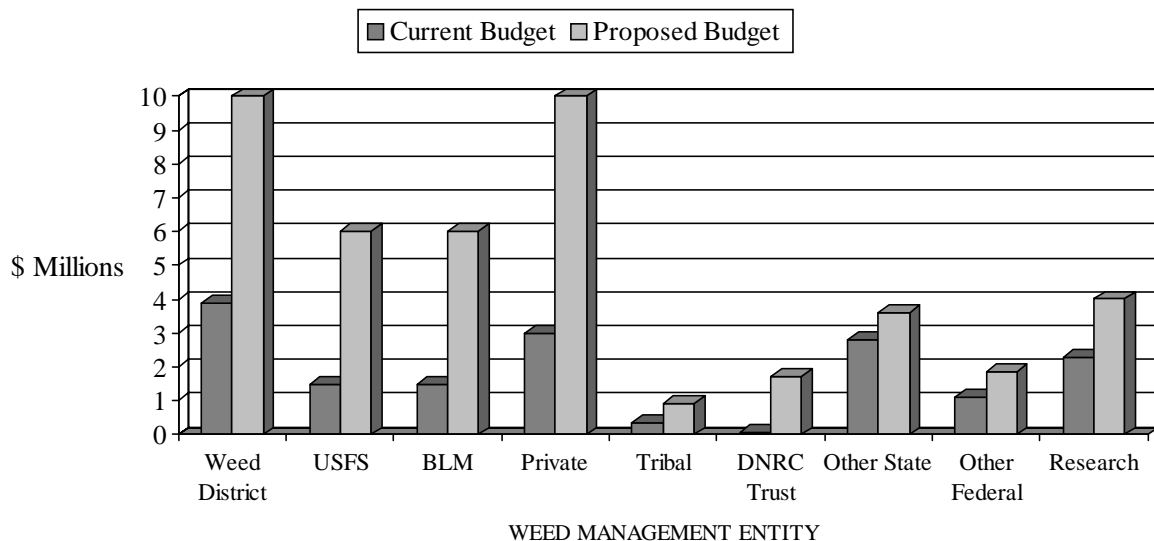
dollars (Table 4.1). This estimate was based on 7.1 million acres infested, a MINIMUM management cost of \$25 per acre, and projected needs identified by agencies. Costs represent a balanced statewide program that allocates funding to various weed management activities. Figure 4.1 indicates current weed management budgets and budget requirements for various weed management entities in Montana.

Table 4.1: Current and Required Annual Budgets for Weed Management Activities in Montana.

Management Activity	Current Budget	% of Budget	Required Budget	% of Budget
Public education and awareness	\$1,300,000	7	\$3,400,000	7
Weed Inventory	585,000	3	4,700,000	10
Prevention/ Early Detection/Rapid Response	1,900,000	10	4,700,000	10
Management (on-ground)*	10,900,000	56	24,000,000	51
Rehabilitation	626,000	3	1,400,000	3
Administration (county, state, fed)	1,400,000	7	4,200,000	9
Research (ARS, APHIS, MSU, UM)	2,570,000	13	4,700,000	10
Total	\$19.3 million		\$47.1 million	

*Adjusted slightly for state and federal agency costs.

Figure 4.1: Current and proposed weed management budgets for various management entities in Montana*¹



¹ County Weed District based on mill levy only. Totals do not include Noxious Weed Trust Fund or other grants.

Chapter 5

Plan Implementation and Evaluation



CHAPTER 5 - PLAN IMPLEMENTATION AND EVALUATION

The key to success of Montana's Weed Management Plan is dependent on the ability of stakeholders to implement action items identified in the Plan. Table 5.1 identifies key action items within the plan, responsible entity for implementing the proposed action, estimated date for completion, and cost involved.

Evaluation of progress on action items is critical to determine whether modifications or additions to the plan are necessary to improve facilitation and implementation. Montana's Weed Management Plan will be reviewed biennially by stakeholders, possibly in conjunction with the Montana Weed Control

Association annual meeting. Status of action items will be reviewed, updated as needed, and suggestions identified for facilitation of the Plan. The Steering Committee and Montana Weed Control Association will be responsible for scheduling the review process and implementing revisions in the Plan. A formal review of the Plan was conducted in 2004 and reports of accomplishments are on file with Montana Department of Agriculture. The following action items represent revisions and updates based on accomplishments since 2000.

Table 5.1: Action Items to Implement for the Montana Weed Plan.

Action Item	Responsibility*	Action Date	Cost and/or Resources	Action Required	Page ¹
LEADERSHIP AND ORGANIZATION					
1) Develop leadership and strengthen MWCA Task Force committees that will direct and facilitate implementation of Plan components.	MWCA	2005	min cost	Develop or strengthen task forces that represent 5 components of the plan. Steering committee would provide guidance and direction for task force groups.	3-2
2) Increase funding for the permanent trust of the NWTF to \$10 million	MWCA, MDA, Steering committee	2010	\$5.24 million	Identify and secure grants and other funding sources to build the permanent trust to \$10 million. Interest from the account will be used to support weed management programs.	2-5, 2-6, 3-2
3) Secure long-term, stable, adequate funding to support County Weed Coordinators and Reservations.	MWCA, MACO, weed district, reservations	2007	\$2.2 million	Identify and secure funds to add \$30,000 in each county and reservation to enhance noxious weed management programs.	2-3, 2-5, 3-2

¹ Page numbers reflect location of program needs and action items identified in the Plan.

THE MONTANA WEED MANAGEMENT PLAN—PLAN IMPLEMENTATION AND EVALUATION

Action Item	Responsibility*	Action Date	Cost and/or Resources	Action Required	Page ¹
4) Establish full-time weed coordinator positions in each county or multi-county area in Montana.	MACO, MWCA	2007	see above	MWCA and Steering Committee work with MACO to increase support for weed coordinator positions.	2-3, 3-2
5) Facilitate endorsement of the Montana State Weed Management Plan by local governments, tribal, county, state and federal agencies, and public.	MWCA, weed district, agencies, tribal, PI	2005	min cost	Agencies and county and city governments adopt action items identified in this Plan.	2-3, 2-7, 2-8, 3-2
6) Update county, state, tribal, and federal weed management plans to complement and support the Montana State Weed Management Plan.	county, state, federal, tribal, and municipal gov't	every 2 yrs	min cost	Update agency/county weed management plans to complement state plan.	2-3, 3-2
7) Establish weed coordinator positions in state and federal agencies to meet program needs.	Steering committee, MWCA, agencies	2006	add cost	Work with state and federal agencies to encourage establishment of weed coordinator positions.	2-9, 2-13, 2-15, 3-2
8) Facilitate development and implementation of IWM plans for local government and agencies that complement the Montana State Weed Management Plan.	MACO, weed district, agencies, commissioners	2007	min cost	County weed districts will work with local government agencies to facilitate development and adoption of vegetation mgt. Plans.	2-6, 2-13, 3-2
RISK ANALYSIS AND PREVENTION					
1) Ensure Montana's efforts complement APHIS programs regarding introduction of exotic species quarantine and control, including national and regional early detection/rapid response system.	APHIS, MWCA prevention task force, MDA	2005	min cost	Meet with APHIS to review prevention programs in Montana	3-3
2) Early detection/rapid response (covered under management)					3-5
3) Work with federal funding agencies to assure compliance with Executive Order 13112.	weed districts, MDT	on-going	min cost		3-3
4) Include monitoring and regulatory protocols in the proposed MDA Nursery Program Procedures Manual.	MDA, weed prevention task force	2005	min cost	Write protocols regarding nurseries and other mail-order outlets that distribute plants into and within Montana.	3-4

THE MONTANA WEED MANAGEMENT PLAN—PLAN IMPLEMENTATION AND EVALUATION

Action Item	Responsibility*	Action Date	Cost and/or Resources	Action Required	Page ¹
5) Identify and delineate un-infested ecosystems within the state as part of current inventory and mapping system.	private, weed districts, agencies, SWCD	on-going	part of inventory \$'s	Identify non-infested sites as part of weed inventory program.	3-4
6) Develop site-specific prevention strategies that include identifying pathways for weed invasion.	weed districts, agencies	on-going	add cost	Weed districts and agencies will include prevention strategies in management plans that include identification and mitigation of invasion pathways.	3-4
7) Enhance communication and education of invasive species professionals to facilitate early detection and eradication / control of newly invading species.	CES, SNWAEC	on-going	min cost	Continue training of CES, weed districts, agencies and other weed management professionals	3-4
8) Improve distribution of state authorized weed alerts with photographs and biological information.	MDA	on-going	min cost	Formalize program and develop distribution procedure.	3-4
9) Create a Category 4 watch list that will provide authority to stop nuisance and noxious weed distribution in Montana.	MDA, MWCA	2005	min cost	Create Category 4 weed list.	3-4
10) Establish incentives to encourage noxious weed seed free forage production to enhance existing laws.	MDA	2005	\$100,000	Establish funding for the program	3-4
11) Encourage implementation of weed prevention strategies as outlined in CIPM Prevention Guidelines (Appendix E).	agencies and municipal gov't; SWCD	on-going	min cost	Encourage implementation of CIPM prevention standards statewide.	3-4
MANAGEMENT - NEW INVADERS AND ESTABLISHED NEW INVADERS					
1) Early Detection/ Rapid Response: Designate/develop a fund for \$4.7 million for prevention, management of new invaders, task force operations, and support of SWAT team.	MDA, MWCA	2006	\$4.7 million annually	MDA will work with MWCA prevention and management task force to designate funds for task force operations, and early detection/rapid response programs	2-10, 3-4, 3-5

THE MONTANA WEED MANAGEMENT PLAN—PLAN IMPLEMENTATION AND EVALUATION

Action Item	Responsibility*	Action Date	Cost and/or Resources	Action Required	Page ¹
2) Identification of high-risk areas for invasion.	Invaders Data Base, weed districts, agencies	on-going	add cost	Identify high risk sites for invasion for noxious weeds.	3-5
3) Organize a Task Force and develop a written management plan for newly invading species that are not covered under existing task force operations.	MWCA, MDA, Steering committee	on-going	Part of \$4.7 million in #1	Organize Task Forces and write management plans as needed	3-5
4) Revise existing management plans to include management budgets.	weed districts, agencies, MDA, Steering committee	on-going	min cost	Provide format for management plans.	3-5
5) Coordinate the hawkweed program at a regional level.	Hawkweed Task Force	2005	min cost	MT hawkweed task force will coordinate and participate in regional hawkweed efforts	3-5
6) Evaluate and monitor existing management efforts.	MDA, agencies	on-going	min cost	Monitor existing management efforts	3-5
7) Annual updates and refinement of weed inventories.	agencies	on-going	min cost	Update and refine inventories	3-6
MANAGEMENT - WIDESPREAD WEED INFESTATIONS					
1) Increase funding for county, state, and federal entities to provide long-term, consistent revenue for weed programs.	MWCA, MACO, agencies	2007	\$23. 4 million annually ¹	Identify and secure funding sources for county, state, and federal weed management programs.	2-3, 2-4, 2-8 to11, 2-13, 2-14, 3-6
2) Expand CWMA concept to optimize weed management efforts and partnerships.	weed district, agencies, CIPM, PI, private	on-going	min cost	Identify and secure regional, federal, state, and private grant revenue to expand CWMA.	2-3 thru 2-6, 3-6, 2-11
3) Promote and assist with implementation of Integrated Weed Management systems.	weed district, agencies, CES, PI, private	on-going	min cost	Promote IWM	2-5, 2-9, 3-7
4) Develop cost-share programs for weed management on private lands.	MWCA, NRCS, SWCD, private	2007	add cost	Identify and secure grant funds for private lands	2-3, 2-4, 3-7

¹ MDT dollars included under Special Management Zones

Action Item	Responsibility*	Action Date	Cost and/or Resources	Action Required	Page ¹
<i>SPECIAL MANAGEMENT ZONES</i>					
1) Finalize MDT Statewide Integrated Weed Management Plan.	MDT	2005	\$2,000	Finalize Plan	3-8
2) Continue to improve monitoring and evaluation of weed management efforts on rights-of-way.	MDT, weed districts	on-going	min cost	Monitor management efforts	3-8
3) Periodically review reimbursement programs to county weed districts to increase efficiency and improve administration.	MDT, weed district, tribes	on-going	min cost	Review reimbursement program as part of operations	3-8
4) MDT contracts will mandate that contractors contact county weed districts for reclamation requirements on roadside projects and monitor reclamation projects on a regular basis.	MDT	2005	min cost	Amend current contract	3-8
5) Increase funding for weed control on highway rights-of-way to meet expansion of rights-of-way in the state.	MDT, weed district	2005	\$300,000 ¹	Increase funding	3-8
6) Identify scope of weed infestations and management issues on railroad rights-of-way.	Railroads, weed district	2006	min cost	Inventory weed infestations on ROW and identify management issues	3-8
7) Develop strategies to address weed management issues on railroad rights-of-way.	Railroads, weed district	2006	min cost	Develop strategies to address weed management issues on ROW.	3-8
8) Support ANS Task Force to address prevention of weed introduction and management along streams and rivers.	ANS Task Force, MWCA, agencies	2005	min cost	Support ANS task force by attending programs and facilitating projects.	2-8, 3-10
9) Identify weed species that are most adapted to movement along waterways.	ANS Task Force	2005	min cost	Identify weed species	3-10

¹ A \$300,000 increase is needed for a total budget of \$1.7 million annually

THE MONTANA WEED MANAGEMENT PLAN—PLAN IMPLEMENTATION AND EVALUATION

Action Item	Responsibility*	Action Date	Cost and/or Resources	Action Required	Page ¹
10) Identify weed-free waterways and water bodies and prioritize protection of these areas.	ANS Task Force	2006	add cost	Identify weed-free waterways	3-10
11) Develop guidelines for implementing integrated weed management on waterways.	ANS Task Force	2005	add cost	Develop IWM guidelines for waterways	3-10
12) Develop partnerships with adjoining states and provinces to determine potential new invaders that could be introduced along waterways.	ANS Task Force	2005	min cost		3-10
13) Encourage education of waterway users and develop advocacy groups.	ANS Task Force, SNWAEC	2005	min cost	Work with CES, Education Task Force, MWCA to promote education and awareness.	3-10
14) County Weed Districts coordinate with state and federal agencies to work with local pit operators in securing sources of noxious weed free gravel and materials.	Weed districts, agencies, tribes	On-going	min cost	Identify and secure sites for gravel and other borrow materials that are weed free.	3-10
RESTORATION AND RECLAMATION					
1) Encourage land managers to evaluate and monitor sites treated for noxious weeds to determine whether restoration, reclamation, and/or revegetation activities are required.	weed district, agencies, SECD, PI	on-going	min cost	Incorporate restoration concepts in land manager training	3-12
2) Develop guidelines for conserving and restoring desirable species and ecosystem function during restoration projects.	CIPM	2005	\$2,000	Develop guidelines, print, distribute	3-12
3) Work closely with federal agency teams on burn rehabilitation plans to incorporate revegetation where noxious weeds are present.	MWCA, agencies	on-going	min cost	Maintain good communication among agencies	3-12

THE MONTANA WEED MANAGEMENT PLAN—PLAN IMPLEMENTATION AND EVALUATION

Action Item	Responsibility*	Action Date	Cost and/or Resources	Action Required	Page ¹
4) Assist land managers in developing integrated weed management techniques that are based on natural plant community change through succession.	weed district, agencies, SWCD, PI	on-going	min cost	Incorporate ecological systems theory into land manager training	3-12
5) Evaluate current restoration research, and increase efforts and funding for research related to enhancement or development of new restoration, revegetation, and reclamation techniques.	Universities, weed districts, agencies	on-going	min cost	Pursue grants and partnerships; maintain communication among researchers	3-12
6) Develop a document containing lists of and uses for desirable species and cultivars in restoration activities.	CIPM, Universities, NRCS, PI, agencies	2006	\$2,000	Facilitate expert collaboration, develop document, print and distribute	3-12
7) Develop seed mixtures for revegetation that may be more resistant to weed invasion.	NRCS PMC, Universities, agencies	on-going	add cost	Coordinate research and development	3-12
8) Educate the public on the importance of revegetating disturbed and weed-infested sites with appropriate site-adapted desirable species.	CES, Educ. Task Force, NRCS, SNWAEC	on-going	add cost	Focus outreach efforts on revegetation and ecological principles	3-12
9) Develop guidelines for multi-species grazing specifically aimed at restoration and long term maintenance of sites.	CIPM, Universities	2006	add cost	Consult experts, develop guidelines	3-12
INVENTORY, MONITORING, AND EVALUATION					
1) Dedicate 10% of weed management budgets toward inventory efforts.	weed district, agencies	2006	\$4.7 million annually	Amount of funding needed to adequately support weed inventory and monitoring in the state.	3-13
2) Complete section-based inventories on Category 1 weeds.	weed districts	2006	add cost	Complete inventories and submit information for inclusion in statewide system.	3-13
3) Encourage yearly completion of internet-based data collection.	weed district, agencies; MDA	on-going	min cost	Train weed district coordinators and other agencies on MRIS program	3-13

THE MONTANA WEED MANAGEMENT PLAN—PLAN IMPLEMENTATION AND EVALUATION

Action Item	Responsibility*	Action Date	Cost and/or Resources	Action Required	Page ¹
4) Encourage participation in the state inventory system.	weed district, agencies, CWMA	on-going	add cost		2-3, 2-8, 3-13
5) Improve efficiency of database management.	MDA, NRIS	on-going	add cost		2-6, 3-13
6) Provide regional and national leadership for weed inventory processes.	MDA, Mapping committee	2006	min cost		3-13
7) Annually inventory known high-risk sites to prevent weed establishment.	weed district, agencies, CWMA	on-going	add cost		3-13
8) Establish the weed mapping system headquarters within the Department of Agriculture.	MDA	2006	add cost		2-7, 3-13
9) Continue annual training in use of the mapping system.	MDA, NRIS	on-going	\$3,000	Provide annual training	3-13
10) Develop an internet reporting system for detailed plant-based data collection.	MDA, NRIS, Invaders Database	2008	add cost	Develop system.	3-13
11) Create a data distribution site for detailed plant-based data.	Invaders Database, MDA	2006	add cost		3-13
12) Evaluate and monitor noxious weed management programs in Montana.	MDA, agencies	on-going	min cost	Continue to evaluate and monitor programs and prioritize areas for management	2-8,3-14
13) Encourage implementation of monitoring and evaluation efforts following "Guidelines for Coordinated Management of Noxious Weeds ¹ " to measure status of projects.	MDA, agencies	on-going	min cost		2-8, 3-14
PUBLIC OUTREACH, AWARENESS, AND EDUCATION					
1) Work with Montana Office of Public Instruction to mandate noxious weed units in State Standards.	SNWAEC	on-going	\$20,000	2005: Add weed units to math and science	3-15
2) Continue to implement the public outreach, awareness and education campaign.	SNWAEC; CES; SWCD	on-going	\$2.1 million	Continue program	3-15

¹ Available [Online] <http://www.weedcenter.org/management/guidelines/tableofcontents.html>

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Action Item	Responsibility*	Action Date	Cost and/or Resources	Action Required	Page ¹
3) Increase professional training opportunities for noxious weed educators.	SNWAEC; CES; MWCA Educ. Comm.	annually	\$7,000 annually	Implement at the 2006 MWCA annual conference	3-6, 3-15
4) Collect and distribute information about successful programs to targeted audiences through new and existing communications channels.	SNWAEC; CES; agencies	on-going	\$25,000 annually	Collect and transfer information on programs to target audience	2-12, 3-6, 3-15
5) Facilitate technology transfer between researchers and land managers.	CIPM, CES, SNWAEC, SWCD; PI; NRCS	on-going	\$100,000	Bring together researchers & land managers at workshops, training sessions, conferences	2-5, 3-15
6) Develop, through communications, collaboration opportunities for grass roots IWM	SNWAEC; CES; weed districts; SWCD, private, local govt.	on-going	min cost		2-3 thru 2-6, 2-12, 3-6, 3-15
7) Develop guidelines that facilitate implementation of IWM.	SNWAEC	2005/06	\$250,000	Draft January 2005 - Tips IWM version Summer 2005 - Weed Identification and IWM Spring 2006 – Ongoing	3-15
8) Secure funding for collaborative noxious weed educational efforts.	SNWAEC	on-going	add cost		3-15
9) Enhance working relationships and maintain/update website links.	SNWAEC	on-going	add cost		3-15
10) Develop priority projects identified by partnerships.	SNWAEC	on-going	min cost		3-15
RESEARCH					
1) Identify and pursue funding sources for basic and applied research defined in the Montana Weed Management Plan.	Universities	on-going	\$4.7 million	Pursue grants and partnerships	2-11, 3-18
2) Support Montana University system and other research institutions to pursue research identified in the Montana Weed Management Plan.	Steering committee; MWCA	on-going	min cost	Maintain communication with scientists at MT University System and other research institutions.	3-18

THE MONTANA WEED MANAGEMENT PLAN—PLAN IMPLEMENTATION AND EVALUATION

***Key to Acronyms:**

Agencies - Refers to all state and federal agencies with land management responsibility.

ANS – Aquatic Nuisance Species Task Force

APHIS – Animal and Plant health Inspection Service

CES – Cooperative Extension Service

CIPM – Center for invasive Plant Management

DEQ – Department of Environmental Quality

DNRC – Dept of Natural Res. and Conservation

FSA – Farm Service Agency

MACO – Montana Association of Counties

MDA – Montana Department of Agriculture

MDT – Montana Department of Transportation

MWCA – Montana Weed Control Association

NRCS – Natural Resource Conservation Service

NRIS – Natural Resource Information Service

PI – Private Industry

SNWAEC – Statewide Noxious Weed, Awareness, and Education Campaign Task Force

SWCD – Soil and Water Conservation District

Weed Districts – County weed districts

CHAPTER 6 - LITERATURE CITED

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CHAPTER 7 - APPENDICES

APPENDIX A: CRITERIA FOR LISTING/DELISTING A NON-NATIVE PLANT

This is an indicator list- not a ranking list.

Name of plant

Date

1. Is the plant pre-adapted to Montana's climate?

____ Yes (80 points)
 ____ Probably yes (40 points)
 ____ Probably no (-40 points)
 ____ No (-80 points)

2. Based on MAPS, what is the percentage of Montana's area that is expected to have suitable climate for this weed (1 point for each percentage).
 ____ points

3. How many neighboring States/Provinces list the weed as noxious?

____ Oregon (6)
 ____ Washington (8)
 ____ Idaho (10)
 ____ Wyoming (10)
 ____ South Dakota (10)
 ____ North Dakota (10)
 ____ Southern Alberta (10)
 ____ Southern Saskatchewan (10)
 ____ British Columbia (10)
 ____ None

____ **TOTAL**

List Other US/Canadian:

4. How many acres does the weed infest in each State/Province?

	Acres	Points
____ Oregon	0-100	1
____ Washington	100-1,000	2
____ Idaho	1,000-5,000	4
____ Wyoming	5,000-10,000	6
____ South Dakota	10,000-50,000	8
____ North Dakota	50,000-over	10
____ Southern Alberta		
____ Southern Saskatchewan		

_____ British Columbia

_____ **0 TOTAL**

5. How many acres does the weed infest in counties/portion of provinces immediately adjacent to Montana?

Acres	Points	_____ acres
0-100	5	
100-1,000	10	
1,000-5,000	20	
5,000-10,000	40	
10,000-50,000	60	
50,000-over	80	_____

6. How many counties in Montana have listed the weed as noxious? (2 pts. for each)

_____ # of counties _____ points

7. How many total acres does the weed infest in Montana?

Acres	Points	_____ acres
0-100	5	
100-1,000	10	
1,000-5,000	20	
5,000-10,000	40	
10,000-50,000	60	
50,000-over	80	_____ points

8. Which environmental types has the weed invaded? (10 pts. for each type)

_____ forest/grassland (>20" ppt)
 _____ forest/grassland (<20" ppt)
 _____ sagebrush/grassland (western Montana)
 _____ sagebrush/grassland (eastern Montana)
 _____ grassland (west)
 _____ grassland (east)
 _____ riparian/wetland
 _____ improved pasture
 _____ cropland
 _____ roadsides/right-of-ways
 _____ aquatic
 _____ **0 TOTAL**

9. Which of the potential negative impacts are associated with this weed?

_____ loss of forage production (10)
 _____ loss of native plants (10)
 _____ loss of biodiversity (10)
 _____ loss of wildlife habitat (10)
 _____ increase soil erosion (10)

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_____ reduce recreational value (10)
 _____ poisonous to any animal (10)
 _____ causes human health concern (10)
 _____ loss of cropland (10)
 _____ none (0)
 _____ **0 TOTAL**

10. Which of the potential positive impacts are associated with this weed?

_____ pollen for honey bees (-5)
 _____ potential food item source (-10)
 _____ potential medical uses (-10)
 _____ grazing value (-10)
 _____ other (-
 10)
 _____ **0 TOTAL**

11. How often has the weed been included in a national or international weed list?
 (5 points for each designated listing)

_____ # of listings _____ points

12. What is the current rate of expansion of the weed?

_____ decline (-5)
 _____ stable (10)
 _____ slow/moderate (20)
 _____ fast (40)
 _____ exponential (60)

13. Which of the following characterizes the plant?

_____ very high seed production (10)
 _____ longlived seedbank (over three years) (10)
 _____ simultaneous asexual and sexual reproduction (10)
 _____ adapted to disturbance (10)
 _____ rapid growth rate (10)
 _____ early and continuous growth throughout the season (10)
 _____ **0 TOTAL**

TOTAL # OF POINTS FOR THIS SPECIES

Please attach biological information on this plant.

APPENDIX B: THE STATEWIDE NOXIOUS WEED LIST AND ACRES INFESTED

Noxious weed acres are based on responses from 48 counties submitting weed acres in 2000, previous inventory records for 6 counties, and no records provided for 2 counties. Acres for Category 2 and 3 weeds were adjusted in 2004 based on Task Force, weed district, or MDA recommendations.

Category 1.	Acres Infested
Canada Thistle (<i>Cirsium arvense</i>)	1,526,803
Field Bindweed (<i>Convolvulus arvensis</i>)	534,853
Whiteweed or Hoary Cress (<i>Cardaria draba</i>)	83,539
Leafy Spurge (<i>Euphorbia esula</i>)	1,200,000
Russian Knapweed (<i>Centaurea repens</i>)	64,466
Spotted Knapweed (<i>Centaurea maculosa</i>)	3,818,450
Diffuse Knapweed (<i>Centaurea diffusa</i>)	27,523
Dalmatian Toadflax (<i>Linaria dalmatica</i>)	204,408
St. Johnswort (<i>Hypericum perforatum</i>)	68,065
Sulfur (Erect) Cinquefoil (<i>Potentilla recta</i>)	275,542
Common tansy (<i>Tanacetum vulgare</i>)	17,089
Ox-eye Daisy (<i>Chrysanthemum leucanthemum</i> L.)	27,153
Houndstongue (<i>Cynoglossum officinale</i> L.)	267,665
Yellow toadflax (<i>Linaria vulgaris</i>)	5,000
Total acres	8,120,556
 Category 2.	
Dyers Woad (<i>Isatis tinctoria</i>)	228
Purple Loosestrife or Lythrum (<i>Lythrum salicaria</i> , <i>L. virgatum</i> , and any hybrid crosses thereof)	287
Tansy Ragwort (<i>Senecio jacobea</i> L.)	23,000
Meadow Hawkweed Complex (<i>Hieracium pratense</i> , <i>H. floribundum</i> , <i>H. piloselloides</i>)	6,508
Orange Hawkweed (<i>Hieracium aurantiacum</i> L.)	51,117
Tall Buttercup (<i>Ranunculus acris</i> L.)	2,005
Tamarisk [Saltcedar] (<i>Tamarix</i> spp.)	15,000
Perennial pepperweed (<i>Lepidium latifolium</i>)	2,750
Total acres	100,895
 Category 3.	
Yellow Starthistle (<i>Centaurea solstitialis</i>)	0
Common Crupina (<i>Crupina vulgaris</i>)	0
Rush Skeletonweed (<i>Chondrilla juncea</i>)	200
Eurasian watermilfoil (<i>Myriophyllum spicatum</i>)	0
Yellow flag iris (<i>Iris pseudacoru</i>)	600

APPENDIX B (CONTINUED): FEDERAL NOXIOUS WEED LIST

Date of List (09/08/2000)

The Federal Noxious Weed list is determined by rule of the U.S. Department of Agriculture under the definitions and provisions of the Federal Noxious Weed Act of 1974, Title 7, Chapter 61. A federal noxious weed is of foreign origin and is new to or not widely prevalent within the United States. Federal noxious weeds are specified as aquatic weeds, parasitic weeds, or terrestrial weeds. For the purpose of weed management on federal lands (Section 2814), a federal agency shall adopt any list classified as noxious by federal or state law.

Aquatic/Wetland

Azolla pinnata (Azollaceae) (mosquito fern, water velvet)
Caulerpa taxifolia (Caulerpaceae) (Mediterranean clone of caulerpa)
Eichhornia azurea (Pontederiaceae) (anchored waterhyacinth)
Hydrilla verticillata (Hydrocharitaceae) (hydrilla)
Hygrophila polysperma (Acanthaceae) (Miramar weed)
Ipomoea aquatica (Convolvulaceae) (Chinese waterspinach)
Lagarosiphon major (Hydrocharitaceae) (Oxygen weed)
Limnophila sessiliflora (Scrophulariaceae) (ambulia)
Melaleuca quinqueriviera (Myrtaceae) (melaleuca)
Monochoria hastata (Pontederiaceae) (monochoria)
Monochoria vaginalis (Pontederiaceae) (pickerel weed)
Ottelia alismoides (Hydrocharitaceae) (duck-lettuce)
Sagittaria sagittifolia (Alismataceae) (arrowhead)
Salvinia auriculata (Salviniaceae) (giant salvinia)
Salvinia biloba (Salviniaceae) (giant salvinia)
Salvinia herzogii (Salviniaceae) (giant salvinia)
Salvinia molesta (Salviniaceae) (giant salvinia)
Solanum tampicense (Solanaceae) (wetland nightshade)
Sparganium erectum (Sparganiaceae) (exotic bur-reed)

Parasitic

Aeginetia spp. (Orobanchaceae)
Alectra spp. (Scrophulariaceae)
Cuscuta spp. other than native or widely distributed species (Cuscutaceae) (dodders)
Orobancha spp. other than native or widely distributed species (Orobanchaceae) (broomrapes)
Striga spp. (Scrophulariaceae) (witchweeds)

Terrestrial

Ageratina adenophora (Asteraceae) (crofton weed)
Alternanthera sessilis (Amaranthaceae) (sessile joyweed)
Asphodelus fistulosus (Liliaceae) (onionweed)
Avena sterilis L. (Poaceae) (animated or wild oat)
Spermacoce alata (Rubiaceae) (borreria)
Carthamus oxyacanthus (Asteraceae) (wild safflower)
Chrysopogon aciculatus (Poaceae) (pilipiliula)
Commelina benghalensis (Commelinaceae) (Benghal dayflower)
Crupina vulgaris (Asteraceae) (common crupina)
Digitaria abyssinica (= *D. scalarum*) (Poaceae) (African couch grass)




Digitaria velutina (Poaceae) (velvet fingergrass)
Drymaria arenarioides (Caryophyllaceae) (lightening weed, alfombrilla)
Emex australis (Polygonaceae) (three-cornered jack)
Emex spinosa (Polygonaceae) (devil's thorn)
Galega officinalis (Fabaceae) (goatsrue)
Heracleum mantegazzianum (Apiaceae) (giant hogweed)
Homeria spp. (Iridaceae) (Cape tulip)
Imperata brasiliensis (Poaceae) (Brazilian satintail)
Imperata cylindrica (Poaceae) (cogongrass)
Ischaemum rugosum (Poaceae) (muraingrass)
Leptochloa chinensis (Poaceae) (Asian sprangletop)
Lycium ferocissimum (Solanaceae) (African boxthorn)
Melastoma malabathricum (Melastomataceae) (no common name)
Mikania cordata (Asteraceae) (mile-a-minute)
Mikania micrantha (Asteraceae) (mile-a-minute)
Mimosa invisa (Fabaceae) (giant sensitive plant)
Mimosa pigra (Fabaceae) (catclaw mimosa)
Nassella trichotoma (Poaceae) (serrated tussock)
Opuntia aurantiaca (Cactaceae) (jointed prickly pear)
Oryza longistaminata (Poaceae) (red rice)
Oryza punctata (Poaceae) (red rice)
Oryza rufipogon (Poaceae) (red rice)
Paspalum scrobiculatum (Poaceae) (Kodo-millet)
Pennisetum clandestinum (Poaceae) (kikuyugrass)
Pennisetum macrourum (Poaceae) (African feathergrass)
Pennisetum pedicellatum (Poaceae) (kyasuma-grass)
Pennisetum polystachion (Poaceae) (missiongrass)
Prosopis alapataco (Fabaceae) (*Prosopis* spp. are mesquites)
Prosopis argentina
Prosopis articulata
Prosopis burkartii
Prosopis caldenia
Prosopis calingastana
Prosopis campestris
Prosopis castellanosi
Prosopis denudans
Prosopis elata
Prosopis farcta
Prosopis ferox
Prosopis fiebrigii
Prosopis hassleri
Prosopis humilis

THE MONTANA WEED MANAGEMENT PLAN—APPENDICES

<i>Prosopis kuntzei</i>	<i>Rubus fruticosus</i> (Rosaceae) (wild blackberry complex)
<i>Prosopis pallida</i>	<i>Rubus moluccanus</i> (Rosaceae) (wild blackberry)
<i>Prosopis palmeri</i>	<i>Saccharum spontaneum</i> (Poaceae) (wild sugarcane)
<i>Prosopis reptans</i>	<i>Salsola vermiculata</i> (Chenopodiaceae) (wormleaf salsola)
<i>Prosopis rojasiana</i>	<i>Setaria pallide-fusca</i> (Poaceae) (cattail grass)
<i>Prosopis ruizlealii</i>	<i>Solanum torvum</i> (Solanaceae) (turkeyberry)
<i>Prosopis ruscifolia</i>	<i>Solanum viarum</i> (Solanaceae) (tropical soda apple)
<i>Prosopis sericantha</i>	<i>Tridax procumbens</i> (Asteraceae) (coat buttons)
<i>Prosopis strombulifera</i>	<i>Urochloa panicoides</i> (Poaceae) (liverseed grass)
<i>Prosopis torquata</i>	
<i>Rottboellia cochinchinensis</i> (Poaceae) (itchgrass)	

APPENDIX C: NOXIOUS WEED DISTRIBUTION MAPS (CATEGORY 1, 2, AND 3)

The Montana Department of Agriculture conducted a survey of Montana County Weed Districts and/or County Extension Agents in January 2005. The purpose of the survey was to record presence or absence of noxious weeds listed on the Statewide Noxious Weed List within each county. Results of the survey were compared to the University of Montana Invaders Database. The following maps indicate the presence or absence of noxious weeds in counties in Montana. The map legend is defined as follows:

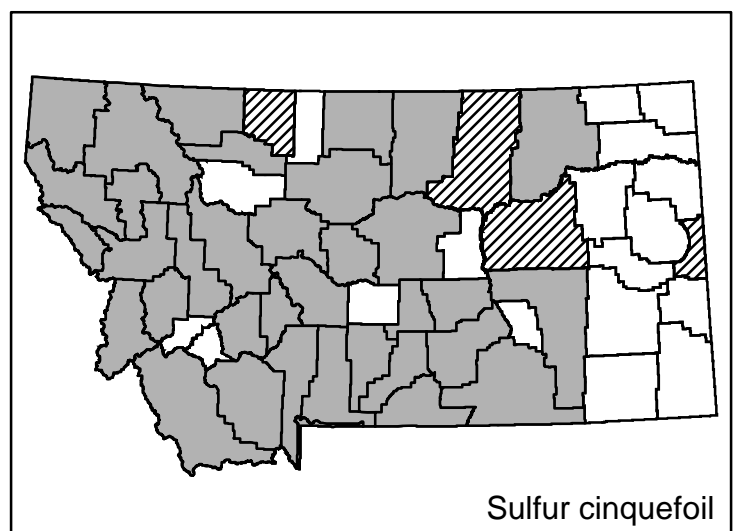
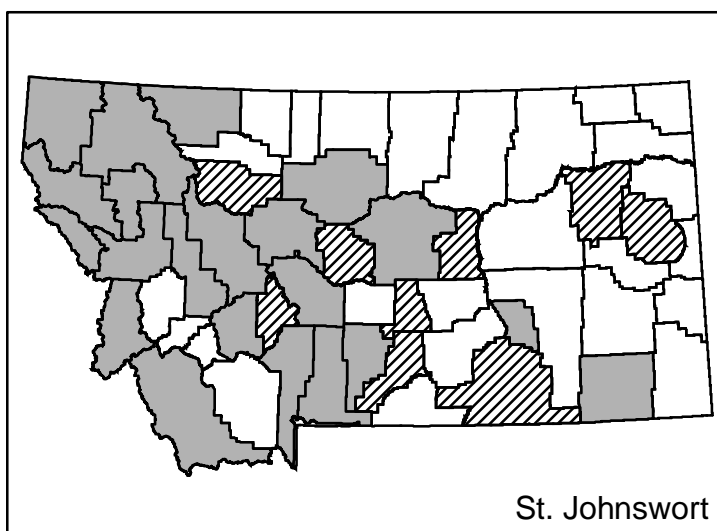
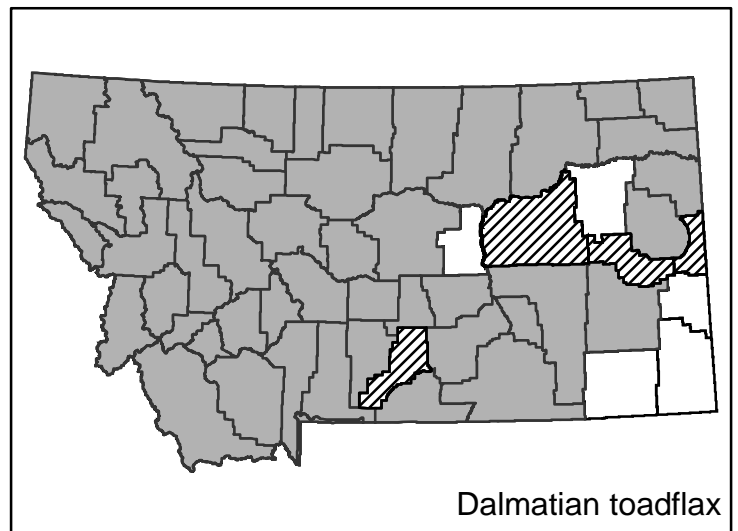
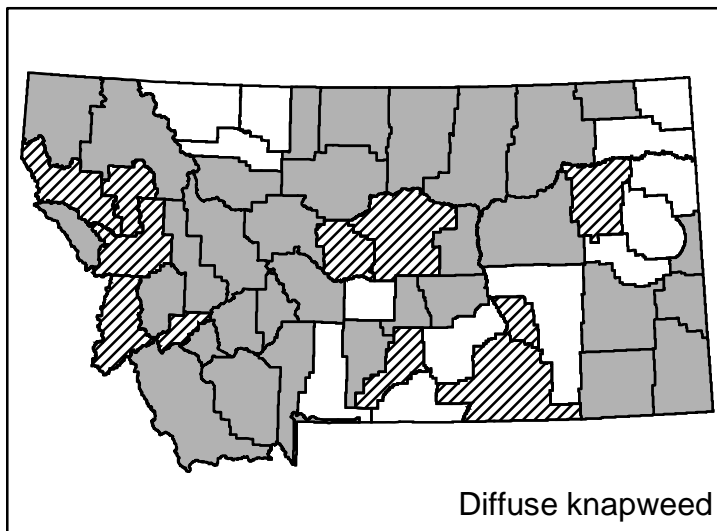
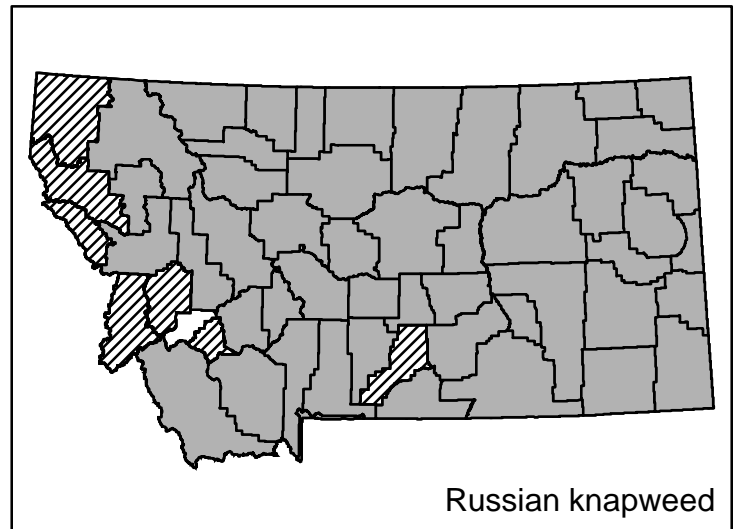
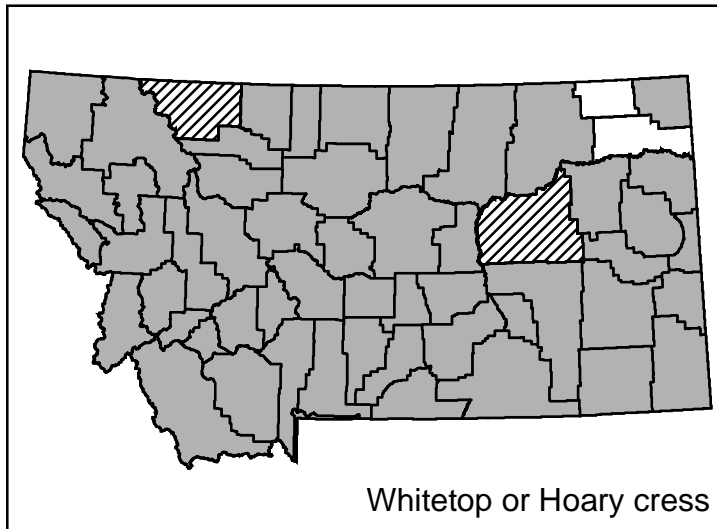
-  **Currently reported:** refers to counties where the weed is reported as present.
-  **Historically present, not currently reported:** indicates a historical record of the weed in the county (based on Invaders Database); however, the weed does not currently occur in the county based on survey results.
-  **Not reported:** indicates that the weed has never been reported to occur within that county.

NOTE: Section based maps of five Category 1 weeds can be accessed through the MSU web site (<http://www.montana.edu/places/mtweeds/>) or viewed as part of the Montana Natural Resource Information System (NRIS) Thematic Mapper located at <http://nris.state.mt.us/mapper/>.

Montana Statewide Noxious Weed Distribution

Category 1

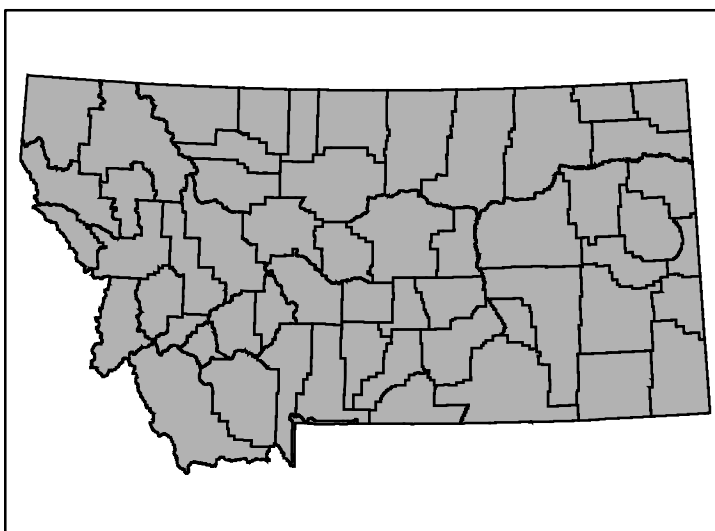
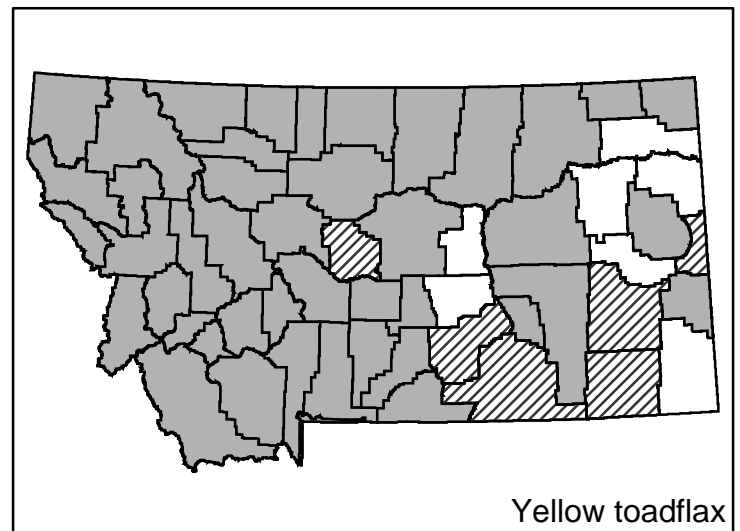
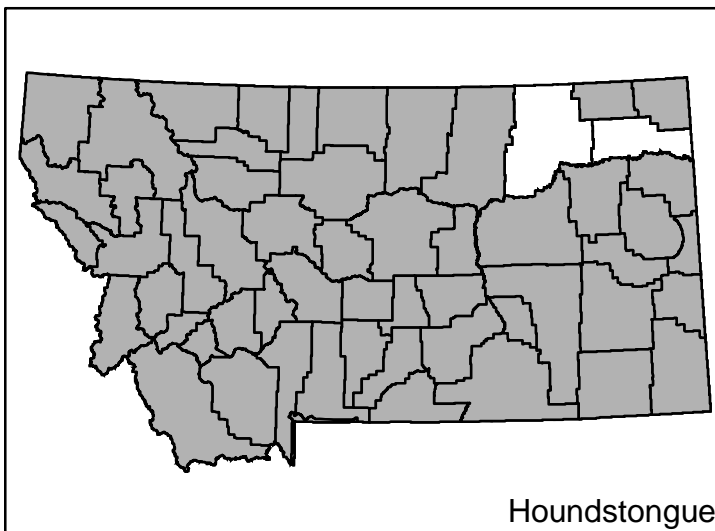
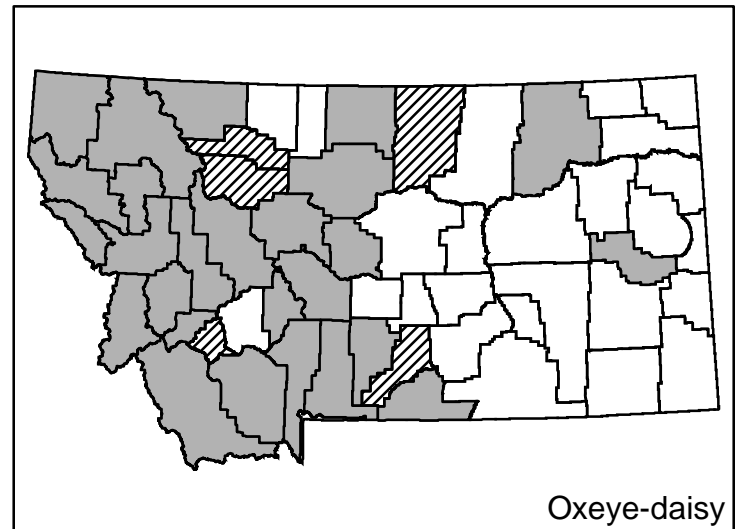
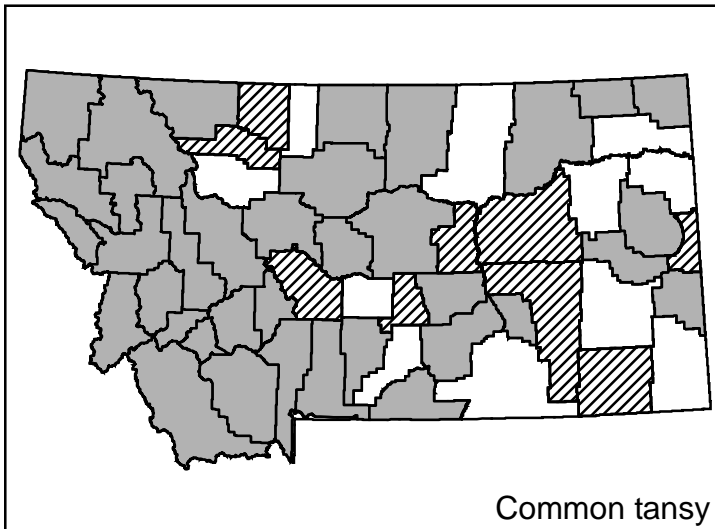
Currently Reported Historically Present, Not Currently Reported Not Reported



Montana Statewide Noxious Weed Distribution

Category 1 (con't)

■ Currently Reported ▨ Historically Present, Not Currently Reported □ Not Reported



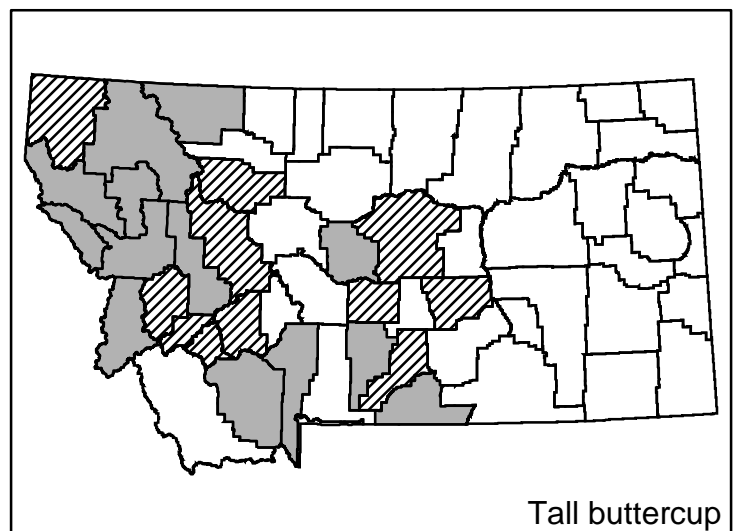
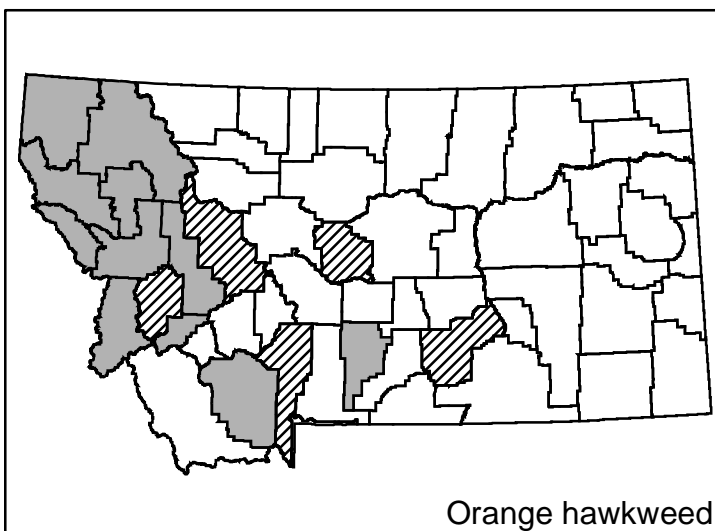
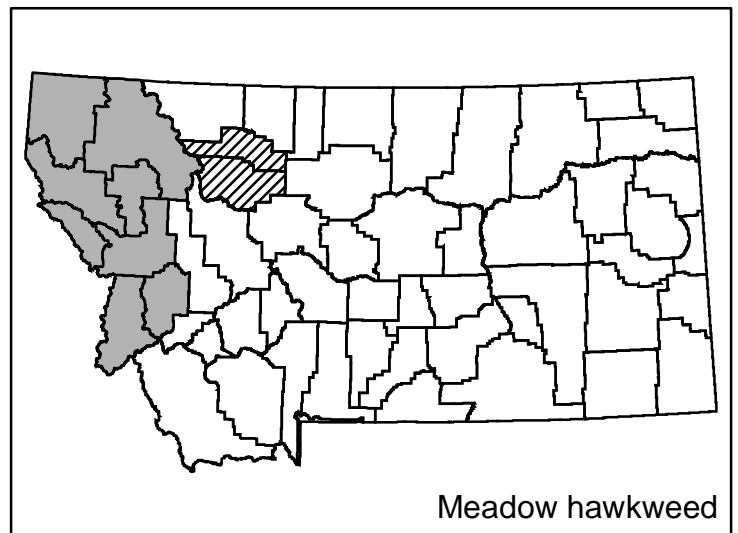
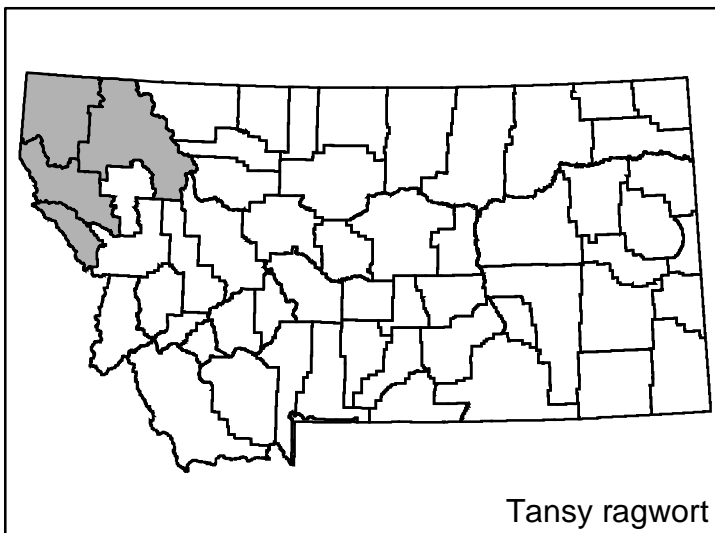
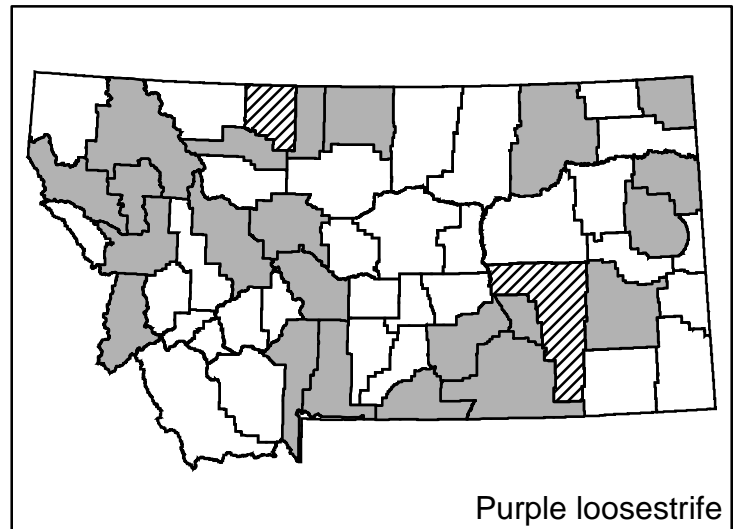
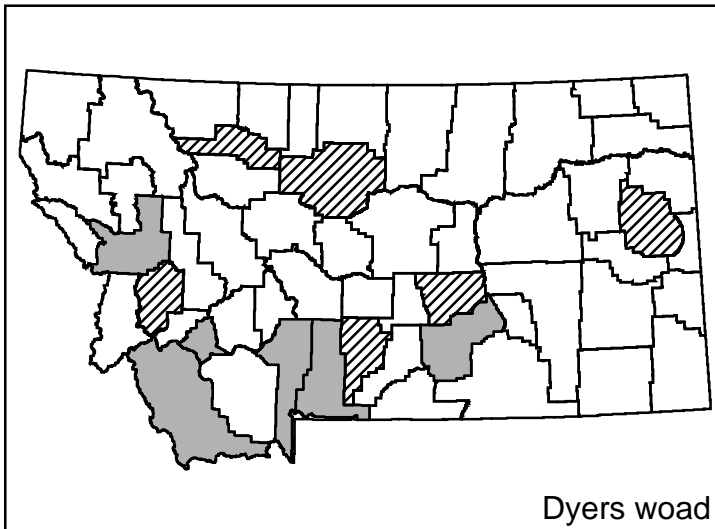
Species Reported In All Counties:

Canada thistle
Field bindweed
Leafy spurge
Spotted knapweed

Montana Statewide Noxious Weed Distribution

Category 2

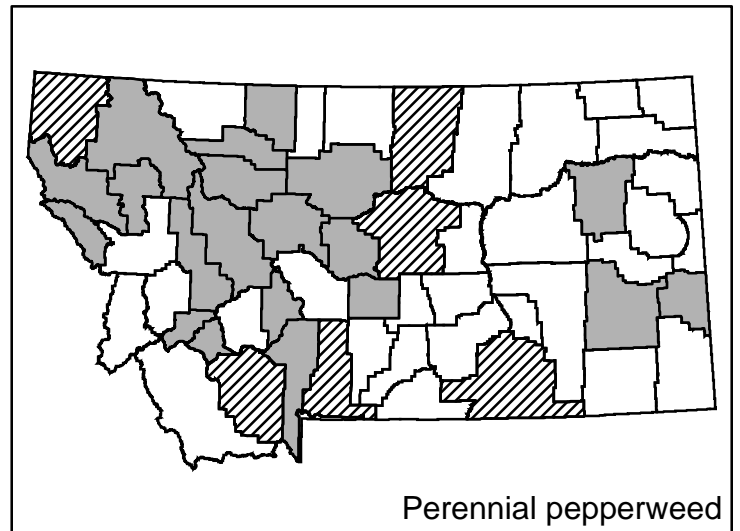
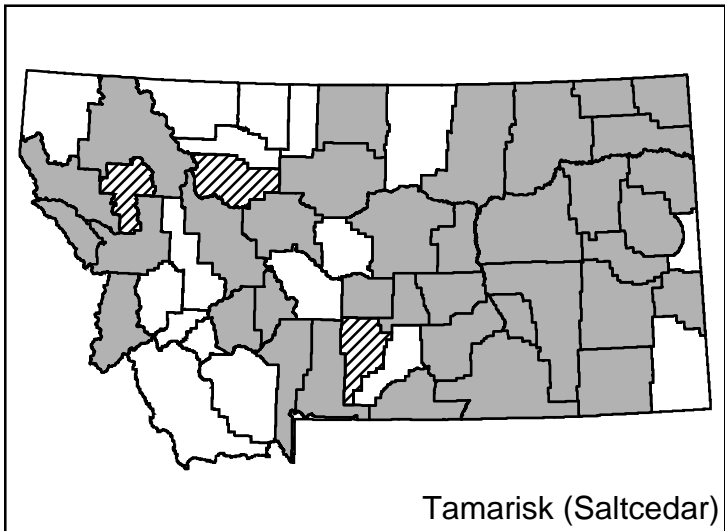
■ Currently Reported ▨ Historically Present, Not Currently Reported □ Not Reported



Montana Statewide Noxious Weed Distribution

Category 2 (con't)

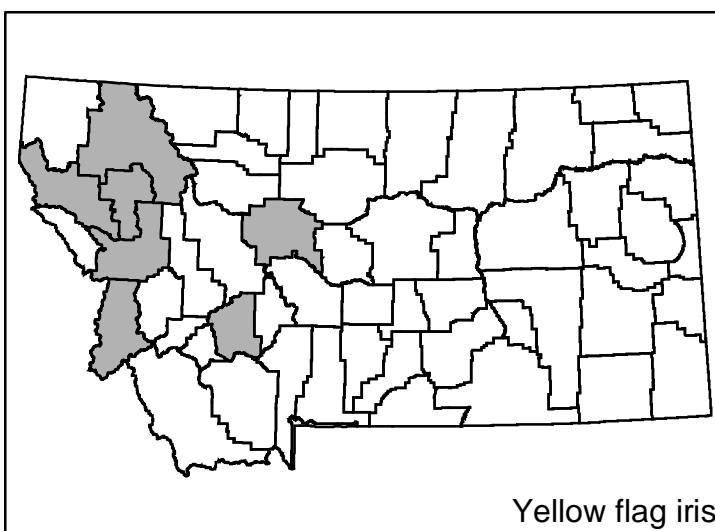
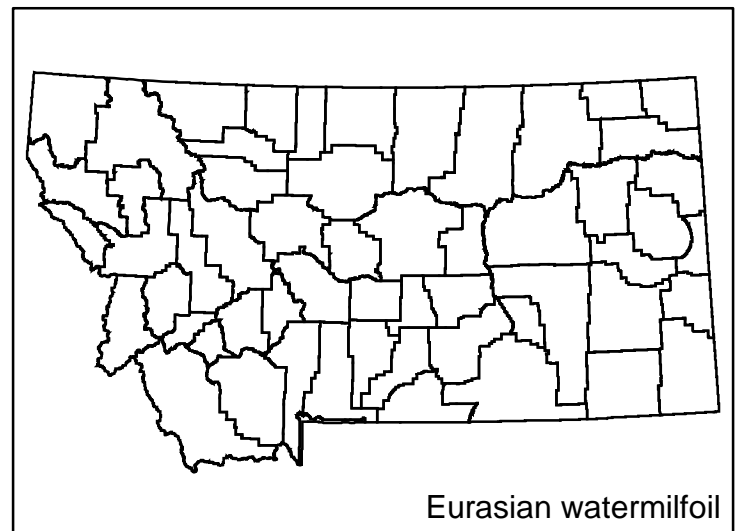
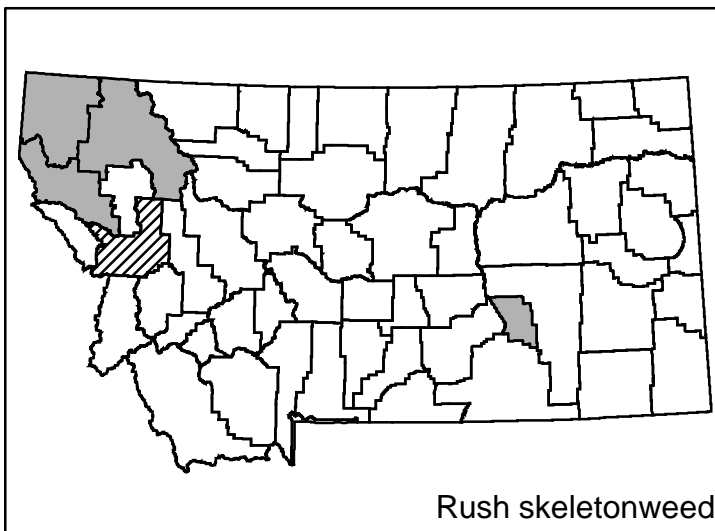
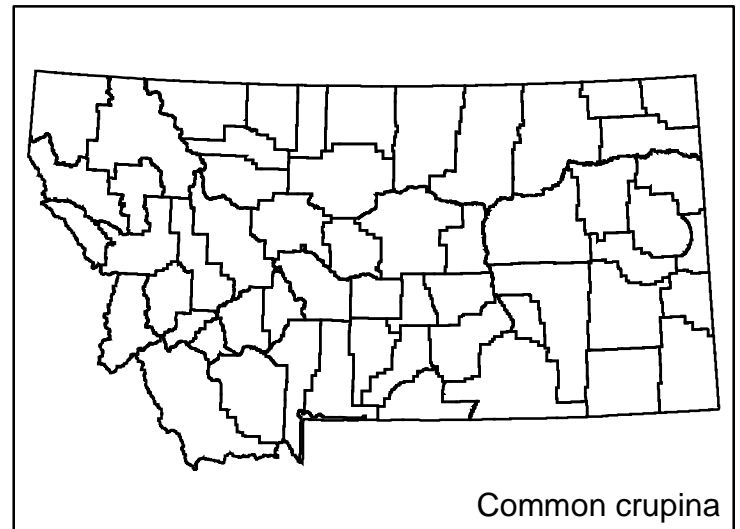
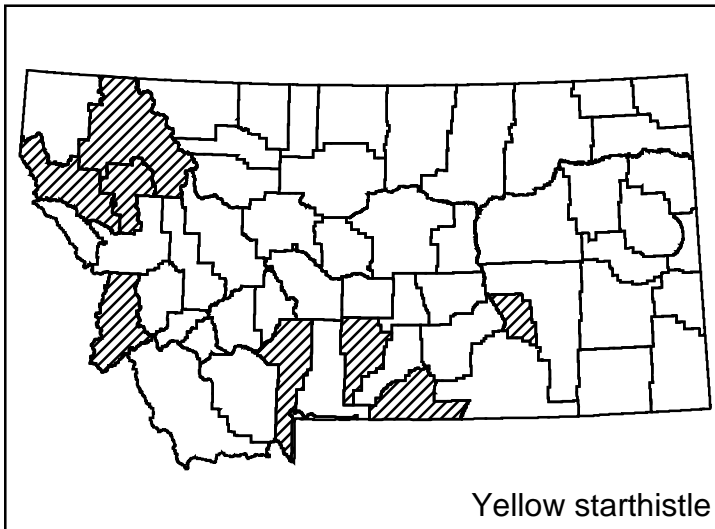
■ Currently Reported ▨ Historically Present, Not Currently Reported □ Not Reported



Montana Statewide Noxious Weed Distribution

Category 3

■ Currently Reported ▨ Historically Present, Not Currently Reported □ Not Reported



APPENDIX D: LEGISLATION ASSOCIATED WITH NOXIOUS WEED PROGRAMS IN MONTANA.

COUNTY WEED CONTROL PROGRAMS AND LEGISLATION

Local county government has the responsibility for implementation and enforcement of weed management in Montana.

Montana County Weed Control Act (Title 7, Chapter 22 Part 21) is implemented and enforced at the local county level. Each county government is required to appoint a county weed control board but funding is permissive. Most of the fifty-six counties in Montana have some level of local weed management program. The law requires counties to develop a long-term management plan for the control of noxious weeds in their county.

While county law mandates minimum requirements, each county weed program is unique due to the disparity of financial and personnel resources, and levels of weed infestations at the county level. County funding is limited to 2 mills, with a yearly local levy allowing counties to fund above the two-mill cap. Some counties have resources to maintain a minimum program, while others develop more aggressive programs that include preventive and educational elements. Total yearly operating budgets for Montana weed districts range from \$13,000 to \$500,000 including grants and contracts. County weed boards in the 56 counties have developed long-term integrated weed management plans.

STATE WEED PROGRAMS AND LEGISLATION

Montana Department of Agriculture (MDA) administers a number of laws relating to weed management in the state.

Section 7-22-2151 of the Montana County Weed Control Act authorizes that any state agency controlling land within a district enter into a written agreement with the board. The agreement must specify mutual responsibilities for integrated noxious weed management on state-owned or state-controlled. The plan must include: a 6-year integrated weed management plan, to be updated biennially; a noxious weeds goals statement; and a specific plan of operations for each biennium, including a budget. Each agency is required to submit a biennial performance report to the Montana Department of Agriculture. These provisions were enacted by the 1995 Montana Legislature and MDA is currently working with agencies and counties to facilitate implementation. State agencies with weed management responsibilities are: Department of Fish, Wildlife and Parks; Department of Natural Resources and Conservation; Department of Transportation; Department of Corrections; Department of Public Health & Human Services; and the University System.

The Montana Weed Control Act (Title 80, Chapter 7 Part 7) provides for technical assistance, funding of noxious plant management programs, and embargoes. Section 80-7-712 MCA allows the Montana Department of Agriculture to obtain federal funds and disburse funds to local governments authorized to conduct noxious plant management programs. In addition, Section 80-7-720 MCA provides for the following regarding biological agents for weed control: (1) the department of agriculture is authorized to expend funds for the collection and distribution of biological agents to control leafy spurge and spotted knapweed. The project will reduce energy consumption by reducing the need for repeated chemical application. (2) The department of natural resources and conservation is authorized to administratively transfer funds to the department of agriculture for the project described in subsection (1).

The Montana Noxious Weed Seed Free Forage Act establishes a state noxious weed seed free forage and mulch certification program used by individuals, agencies, and private corporations on public and private lands. The Montana program supports and complements the regional North American Weed Management Association (NAWMA) Noxious Weed Free Forage Certification Program. This program provides forage products that are free of regionally designated noxious weeds seeds or any injurious portions of plants and any propagating parts of plants that are capable of producing new plants.

The Montana Agricultural Seed Act lists prohibited and restricted seed levels that must be maintained in state certified seed. All state noxious weeds are included in this list.

The Montana Commercial Feed Act prohibits noxious weeds in commercial feed.

The Montana Nursery Law allows for inspection, certification, and embargo of all nursery stock for listed pests, including weeds.

The Montana Environmental Policy Act must be addressed by all MDA actions that have potential environmental or socioeconomic impacts.

The Montana Noxious Weed Trust Fund Act is a grant-funding program designed to encourage local cooperative weed management programs, creative research in weed control, including the development of biological control methods, and educational programs. The MDA is responsible for weed supervisor training standards and listing of statewide noxious weeds by rule under the Montana County Weed Control Act. Revenue for the current grants program comes from interest from the \$4.76 million Trust and from the vehicle weed fee of \$1.50 per vehicle. Annual revenue from these two sources varies with current interest rates and averages between \$1.2 and \$1.7 million. In addition to the interest, the Noxious Weed Trust Fund (NWTF) receives \$101,337 annually from the Montana General Fund (these funds were redirected in 2003 from FWP general fund to the Department of Agriculture general fund), and in 2004, a grant of \$100,000 from the Natural Resource Conservation Service. Since 2001, \$830,000 annually has been provided to the NWTF from USDA Cooperative Forestry Assistance to manage weed infestations on Private, tribal and non-federal public lands having 10% tree cover.

The Montana Trust Fund Grants Program started in 1985 with a \$1,000,000 grant from the Montana Resource Indemnity Trust Fund to provide for the development of local cooperative weed control programs and creative weed management research. Half of the original grant established a permanent Trust Fund and half funded cost-share weed control to local landowners. Additional funding for the program was through a 1% herbicide surcharge on the retail value of all herbicide sold in Montana. Half of this revenue funded grants and half was deposited in the Trust Fund account.

In 1987 additional revenue supplemented the grants program with a \$.50 fee on the registration of all vehicles in the state. The weed vehicle fee was increased to \$1.50 in 1989. When the permanent Trust Fund reached the target goal of \$2.5 million in 1992, the herbicide surcharge was repealed. Senate Bill 164 provided two lump sum payments of \$1,125,000 from Montana Department of Transportation non-restricted highway funds to the NWTF that increased the permanent Trust Fund. Revenue for the current grants program comes from interest from the \$4.76 million Trust and from the vehicle weed fee of \$1.50 per vehicle. Annual revenue from these two sources varies with current interest rates and averages between \$1.2 and \$1.7 million.

The noxious weed grants program is competitive and applications are submitted to the Department of Agriculture once per year (generally March). Grant requests for funding are about double the amount available through the NWTF program. There is an 11 member Noxious Weed Advisory Council chaired by the Director of the Montana Department of Agriculture that reviews all grant applications and provides funding recommendations to the Director. All applicants present their grant requests at a hearing of the Council. The MDA director appoints the advisory council, which includes members representing the following interests: 1) livestock production; 2) agriculture crop production; 3) recreationist/wildlife group; 4) herbicide dealer or applicator; 5) consumer group; 6) biological research and control interests; 7) the Montana weed control association; 8) counties, one each from the western and eastern parts of the state, which may include a county commissioner, district weed board member, or weed district supervisor; and 9) an at-large member from the agricultural community.

Cooperative Weed Management Grants encourage county weed districts, local landowners, local federal and state land managers to develop long-term management programs within a defined project area. Matching funds are required for the IWM projects. Grant applicants must submit provide an environmental assessment checklist regarding attributes of the project. Since its inception, the NWTF has awarded 899 local cooperative grants for a total of about \$16.9 million. Additional detail is discussed under CWMAs in Chapter 2 of this plan.

Research Projects are also funded through this program. Much of this funding supports the development of biological control agents for Montana noxious weeds. Other weed research includes revegetation projects, herbicide-resistant weed research, and grazing projects. There have been 154 research projects funded by the NWTF since 1985. The percent of NWTF revenue allocated for research was 33.2% from 1985 through 1999, and 9% (\$1,192,506) from 2000 through 2004. Over \$2.7 million has been spent on the development of biological control agents under the Trust Fund program since 1985.

Educational Programs target education of land managers on proper weed management techniques and education of the general public to encourage their support of weed control in Montana. A total of 172 educational projects have been funded by the NWTF since 1985. The percent of NWTF revenue allocated for educational grants was 9.9% from 1985 through 1999, and 7% (\$890,673) between 2000 and 2004. Examples of funded projects include the development of the Montana weed calendar, public service announcements, weed identification brochures, weed surveys and mapping, high school greenhouses and integrated control projects, weed supervisor and weed board member training, sportsman training, and realtor training.

Special County and Reservation Grants were instituted in 1994 from funds in the grants program. Each of the 56 Montana county weed districts and seven Montana reservations may apply for \$6,200 each year to fund any part of their program that will help maintain an effective weed program. This program has funded 741 projects through FY2005, for a total of \$4,738,668.

APPENDIX E: INVASIVE PLANT PREVENTION GUIDELINES

The Invasive Plant Prevention Guideline published by the Center for Invasive Plant Management (CIPM) is a comprehensive, concise guide that provides practical techniques to prevent the invasion and permanent establishment of invasive plants on roadsides and in natural areas. The guide is based on the USDA Forest Service “Guide to Noxious Weed Prevention Practices”, with input from Montana State University, Utah State University, Oregon State University, and USDA Agricultural Research Service. The guide includes information developed by the Montana Prevention Task Force. Material in the guide is divided into four sections:

Invasive Plant Prevention: Lands addresses prevention strategies for site-disturbing projects such as road-building and timber harvesting, considerations for land-use planning, and movement of people and equipment within natural areas.

Invasive Plant Prevention: Water addresses prevention strategies in riparian areas and watersheds, as well as providing tips for aquatic recreation.

Invasive Plant Prevention: Animals addresses prevention strategies specific to grazing management, wildlife, and movement of horses and pack animals into the backcountry.

Invasive Plant Prevention: Fire addresses prevention strategies for prescribed burns as well as firefighting and post-fire land rehabilitation.

This guide was developed with the firm conviction that healthy, non-infested ecosystems can be protected from the introduction and establishment of invasive plants by following practical, proactive, weed prevention guidelines. Elements of the prevention document include:

- Limiting the introduction of weed seeds into an area;
- early detection and eradication of small patches of weeds;
- minimizing disturbance of desirable vegetation along roadsides, trails, and waterways;
- managing land to build and maintain healthy communities of native and desirable plants to compete with weeds;
- careful monitoring of high-risk areas such as human and animal transportation corridors and disturbed or bare ground;
- revegetating disturbed sites with desirable plants; and
- evaluating annually the effectiveness of the prevention plan so appropriate adaptations can be implemented the following year.

This guide is available for \$1.50 or to download free at www.weedcenter.org, the CIPM website at Montana State University – Bozeman.

APPENDIX F: COOPERATIVE WEED MANAGEMENT AREAS

A Cooperative Weed Management Area (CWMA) is an excellent tool for coordinating action and sharing expertise and resources to combat common weed species in a defined geographical area. These local organizations bring together landowners and land managers (private, city, county, state, and federal) to effectively manage weeds as a unified group. Locally-driven CWMA's are especially effective at generating public interest in weed management and organizing community groups to support on-the-ground programs.

DEVELOPING CWMAS IN MONTANA

In Montana, every county is a weed district with a county weed management plan. In cooperation with the county weed coordinator, CWMA's may be established by landowners or land managers to encompass part of a county, or a natural land area (such as a watershed) that includes adjoining parts of several counties. CWMA's do not supplant county weed districts; rather, CWMA steering committees that include county weed personnel facilitate cooperation across private, county, state, and federal boundaries.

CWMA's often function under the authority of a mutually developed Memorandum of Understanding or Cooperative Agreement and are governed by a steering committee. In designating a CWMA, the first steps are:

- **Invite all landowners/managers:** Call an organizational meeting to bring together all the potential partners, listen to each other's ideas and concerns about a CWMA, and begin to develop a group vision and plan.
- **Develop boundaries:** Establish clearly-defined boundaries, generally coordinated with counties and possibly adjoining CWMA's. Boundaries of a CWMA may be created according to watersheds, topography, weed species, land usage, and/or rights-of-way.
- **Identify special management zones** within the CWMA such as: aquatic areas, habitats of threatened and endangered species or species of special concern, recreational/special use areas, transportation corridors, and relatively weed-free areas. For instance, weed-free areas should be identified, prioritized for prevention, and given special designation and protection.

CREATING A CWMA MANAGEMENT PLAN

Together, CWMA partners develop a comprehensive weed management plan for their area. (Detailed information regarding development of Weed Management Areas is described in "Guidelines for Coordinated Management of Noxious Weeds: Development of Weed Management Areas"¹.) At the least, CWMA plans include weed surveying and mapping components as well as strategies for integrated weed management and prevention. More comprehensive plans may include public education and training, early detection of new invaders, monitoring, and annual evaluation and adaptation of the weed management plan. An initial assessment of the situation (landowner involvement, weed abundance and distribution, impacts of weeds, current management, level of community support, etc.) will determine the weed management objectives. For example, rather than treat weeds immediately, it may be most effective to establish awareness and prevention programs first.

Elements of a typical weed management plan include:

¹ Available [Online] <http://www.weedcenter.org/management/guidelines/tableofcontents.html>

- A complete description of the proposed area, including natural features, soil types, transportation corridors, population centers, maps, and descriptions of weed infestations.
- Goals and objectives, including long-term priorities and planning (five to 10 years), which may address prevention strategies; weed reduction, containment, or eradication; and educational programs.
- Budgets, including funding sources (federal, state county, local landowner, grants) and shared equipment, supplies, and staffing. Determine short- and long-range needs: equipment purchases, herbicides, rearing cages for biocontrol agents, public outreach materials, etc. Develop a yearly procurement plan to include personnel, operations, equipment, and supplies.
- Cooperators' roles and responsibilities, including a list of agencies and jurisdictions involved, and a timeline.
- A list of target weeds and potential control methods with pros and cons of each. Note recommended control for a specific area, the timing of control, and recommended rates.
- Special management zones, including areas with stringent management criteria, relatively weed-free areas that would benefit from site-specific prevention strategies, and disturbed areas (for example, burned or flooded sites) that may require immediate attention.
- Strategies for gathering public comment on the management plan. This can help increase public awareness and build public support.
- Evaluations, which should be conducted annually and should include a weed inventory to determine whether the long-term goals of reducing weed populations or preventing infestations are being met. Management plans will change over time to insure their effectiveness as new situations arise.

ADVANTAGES OF A CWMA

CWMAs encourage long-term planning to a successful resolution. Planning establishes priorities – cooperators can emphasize a particular species or area. CWMAs focus attention and provide a united front to state and federal legislators, as well as communicate to the general public the seriousness of good land management and the value of healthy ecosystems. CWMAs pool talents and resources; address the problem of weeds spreading from neighboring land before the damage occurs; provide channels for communication between cooperators; and adequately assess the risk of damage to water, crops, threatened and endangered species, etc. CWMAs base control efforts on biological and geographical factors rather than legal divisions, thus increasing the effectiveness of weed management. And finally, CWMAs may help secure more stable funding for long-term management and prevention efforts.

APPENDIX G: BUDGET FIGURES

Budget figures include either requested budgets by specific entities, or estimated required budgets based on weed-infested acres. The budget does not include increases in grant revenue required by the Noxious Weed Trust Fund to meet needs of private and public landholders in the state.

Entity	Current Annual Budget	Required budget
County Weed District (mills/general fund) ¹	\$ 3,898,000	\$ 10,000,000
Bureau of Land Mgt	\$ 1,500,000	\$ 6,000,000
US Forest Service	\$ 1,500,000	\$ 6,000,000
Natl. Park Service	\$ 285,440	\$ 530,000
Fish and Wildlife Service	\$ 200,000	\$ 600,000
Bureau of Reclamation	\$ 63,000	\$ 190,000
Tribal (Trust Lands)	\$ 403,865	\$ 975,000
Natural Resource Conservation Ser. ²	\$ 550,000	\$ 550,000
MT Dept. of Agriculture	\$ 277,000	\$ 277,000
DNRC Trust Lands	\$ 60,000	\$ 2,000,000
DNRC Water Bureau ³	\$ 2,500	\$ 30,000
MT Dept Transportation	\$ 1,375,000	\$ 1,700,000
MT Fish, Wildlife, & Parks	\$ 494,201	\$ 495,000
Dept. of Corrections	\$ 22,545	\$ 25,000
Dept. of Health and Human Ser.	\$ 7,400	\$ 7,500
Private landowners ⁴	\$ 3,000,000	\$ 10,000,000
University Land (UM, MSU)	\$ 68,627	\$ 120,000
University Extension ⁵	\$ 400,000	\$ 800,000
University Research	\$ 1,541,000	\$ 3,170,000
USDA Ag. Research Ser. ⁶	\$ 729,000	\$ 800,000
USDA APHIS	\$ 43,750	\$ 43,750
Education Task Force ⁷	\$ 112,000	(\$ 2,600,000)
Noxious Weed Trust Fund ⁸	\$ 2,543,659	\$ 2,543,659
Other granting sources	\$ 232,000	\$ 232,000
	\$ 19,308,987	\$ 47,100,909

¹ Includes county-tax generated revenue not contract labor or grants.

² Estimated contribution to noxious weed programs.

³ Based on a 0.5 FTE and current weed management needs.

⁴ Calculated for range, pasture, and wildland only based on herbicide sales and NWTF grants (total does not include grant dollars)

⁵ Based on University Extension time + 46 county ag agents @ \$47,000/yr and 15% of time spent on weed management activities.

⁶ Based on ½ of ARS-Sidney budget plus Ft. Keogh weed research program.

⁷ Revenue would be generated from private, state, and federal revenue sources (included in “required budgets” for various entities.

⁸ Does not include permanent trust.



“PROBLEMS CANNOT BE SOLVED AT
THE SAME LEVEL OF AWARENESS
THAT CREATED THEM”

-ALBERT EINSTEIN

PARTNERS

